Vol. 1016 Number 4

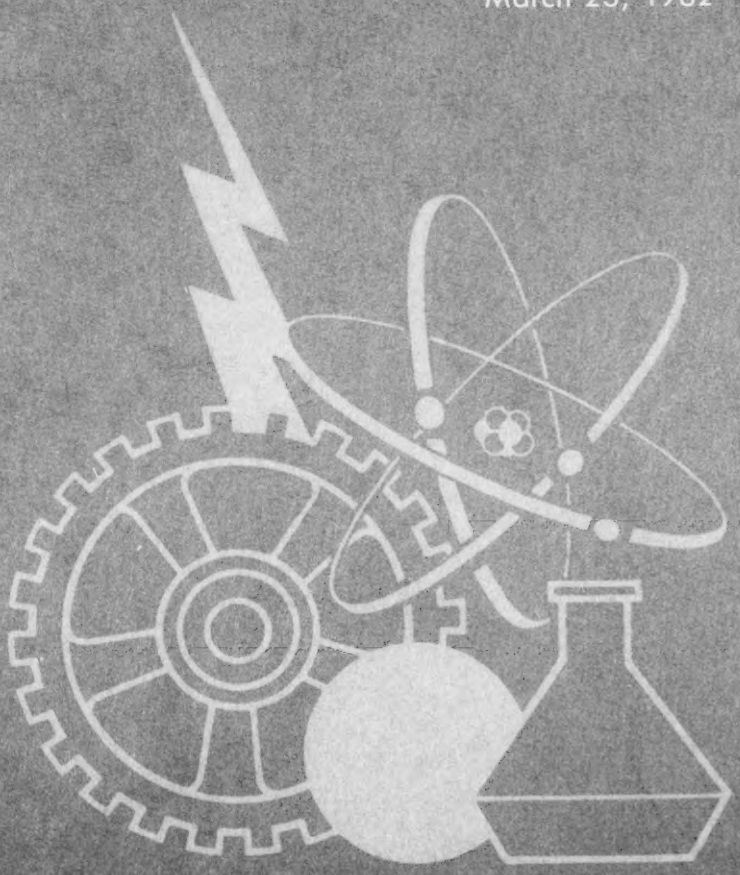
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 23, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 23, 1982 Volume 1016 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,339,378, Re. S.N. 302,251, Filed Sept. 14, 1981, Cl. 063/028, PROCESS FOR THE SECURING OF PRECIOUS STONES OR THE LIKE IN THEIR MOUNT AND PRODUCTS OBTAINED BY THE APPLICATION OF THE SAID PROCESS, Francis Chirol, Owner of Record: *Gemveto Jewelry Co., Inc., New York, N.Y.,* Attorney or Agent: M. Arthur Auslander, et al., Ex. Gp.: 333

3,754,309, Re. S.N. 325,576, Filed Nov. 27, 1981, Cl. 407/77, CUTTING INSERT AND CLAMPING ARRANGEMENT THEREFOR, Dennis G. Jones, et al., Owner of Record: *Kennametal, Inc., Latrobe, Pa.,* Attorney or Agent: George A. Gust, et al., Ex. Gp.: 324

3,794,732, Re. S.N. 301,759, Filed Sept. 14, 1981, Cl. 424/283, RUMINANT FEED UTILIZATION IMPROVEMENT, Arthur P. Raun, Owner of Record: *Eli Lilly and Co., Indianapolis, Ind.,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 125

3,987,784, Re. S.N. 315,032, Filed Oct. 26, 1981, Cl. 126/447, SOLAR ENERGY ABSORBER PANEL, Joseph A. Godrick, Owner of Record: *Kennecott Copper Corp., New York, N.Y.,* Attorney or Agent: Anthony B. Askew, Ex. Gp.: 345

4,077,006, Re. S.N. 321,999, Filed Nov. 16, 1981, Cl. 455/3, BIDIRECTIONAL UNICABLE SWITCHING SYSTEM, Victor Nicholson, Owner of Record: *Inventor,* Attorney or Agent: James C. Wray, Ex. Gp.: 233

4,177,080, Re. S.N. 340,087, Filed Jan. 18, 1982, Cl. 106/281R, METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS, Robert L. Mendenhall, Owner of Record: *Inventor,* Attorney or Agent: Jerry R. Seiler, et al., Ex. Gp.: 142

4,193,637, Re. S.N. 318,618, Filed Nov. 5, 1981, Cl. 299/56, ROTARY CUTTERHEAD FOR AN EARTH BORING MACHINE, Barry A. Spencer, Owner of Record: *The Robbins Co., Seattle, Wash.,* Attorney or Agent: John O. Graybeal, et al., Ex. Gp.: 354

4,215,941, Re. S.N. 340,086, Filed Jan. 18, 1982, Cl. 366/25, METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS, Robert L. Mendenhall, Owner of Record: *Inventor,* Attorney or Agent: Jerry R. Seiler, et al., Ex. Gp.: 242

4,220,104, Re. S.N. 294/817, Filed Aug. 20, 1981, Cl. 112/262.100, HOSIERY, John C. Humphreys, Owner of Record: *Paramount Textile Machinery Co., High Point, N.C.,* Attorney or Agent: David Rabin, Ex. Gp.: 353

4,239,244, Re. S.N. 322,910, Filed Nov. 19, 1981, Cl. 277/188R, HYDRAULIC PISTON ROD SEAL, Robert G. Brent, Owner of Record: *Textron, Inc., Providence, R.I.* Attorney or Agent: Richards, et al., Ex. Gp.: 241

4,268,416, Re. S.N. 326,096, Filed Nov. 30, 1981, Cl. 252/416, GASEOUS PASSIVATION OF METAL CONTAMINANTS ON CRACKING CATALYST, Laurence O. Stine, et al., Owner of Record: *UOP, Inc., Des Plaines, Ill.,* Attorney or Agent: James R. Hoatson, et al., Ex. Gp.: 117

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,048,544, Reexam. No. 90/000,163, Requested: Feb. 17, 1982, Cl. 315/408, SWITCHED VERTICAL DEFLECTION SYSTEM, Peter Eduard Haferl, Owner of Record: *RCA Corp., Princeton, N.J.,* Attorney or Agent: Eugene M. Whitacre, Ex. Gp.: 220, Requester: RCA Corp., Princeton, N.J.

4,222,518, Reexam. No. 90/000,161, Requested: Feb. 17, 1982, Cl. 235/375, METERING SYSTEM, Luther G. Simjian, Owner of Record: *Inventor,* Attorney or Agent: Ervin B. Steinberg, Ex. Gp.: 234, Requester: Pitney Bowes, Inc., Stamford, Conn.

4,264,083, Reexam. No. 90/000,164, Requested: Feb. 19, 1982, Cl. 280/154.5R, SPLASH GUARD, Kenneth S. Mathew, et al., Owner of Record: *Custom Accessories, Inc., Lincolnwood, Ill.,* Attorney or Agent: Harry V. Strampel, et al., Ex. Gp.: 316, Requester: Pretty Products, Inc., Coshocton, Ohio

PATENT NOTICES

Certificates of Correction for the Week of Mar. 23, 1982

Re. 30,749	4,278,897	4,295,088	4,303,505
D. 261,554	4,279,636	4,295,127	4,303,966
4,034,740	4,280,184	4,295,253	4,304,093
4,122,769	4,281,090	4,295,501	4,304,274
4,224,481	4,281,354	4,296,005	4,304,310
4,225,151	4,281,559	4,296,309	4,304,533
4,238,160	4,282,260	4,296,513	4,304,575
4,245,257	4,282,270	4,296,580	4,304,650
4,245,381	4,282,863	4,297,152	4,304,658
4,246,291	4,284,261	4,297,179	4,304,820
4,247,660	4,284,513	4,297,640	4,304,822
4,247,670	4,284,987	4,297,763	4,305,364
4,252,655	4,285,406	4,298,338	4,305,383
4,253,158	4,285,545	4,298,400	4,305,463
4,255,557	4,285,859	4,298,505	4,305,570
4,257,631	4,287,231	4,298,608	4,305,727
4,257,967	4,288,437	4,298,705	4,306,051
4,259,028	4,288,988	4,298,854	4,306,261
4,260,232	4,289,888	4,299,111	4,306,288
4,262,119	4,290,296	4,299,186	4,306,342
4,264,476	4,290,393	4,299,674	4,306,672
4,267,269	4,290,848	4,299,828	4,307,833
4,268,468	4,291,006	4,300,291	4,308,014
4,268,668	4,291,456	4,301,128	4,308,334
4,271,726	4,291,475	4,301,697	4,308,706
4,273,689	4,291,750	4,301,925	4,309,147
4,275,201	4,292,013	4,302,253	4,309,206
4,276,535	4,292,130	4,302,769	4,310,120
4,276,538	4,292,182	4,302,968	4,310,427
4,277,885	4,292,463	4,303,052	4,311,059
4,278,868	4,294,502	4,303,325	4,311,385

Disclaimers

4,058,735.—*Franz Tippner,* Braunschweig, Germany OPTO-ELECTRONIC CONTACT MECHANISM. Patent dated Nov. 15, 1977. Disclaimer filed Dec. 21, 1981, by the assignee, *Siemens Aktiengesellschaft.*

Hereby enters this disclaimer to all claims of said patent.

4,237,767.—*David H. Levine,* Tarzana, Calif. CHIME ASSEMBLY. Patent dated Dec. 9, 1980. Disclaimer filed Jan. 25, 1982, by the assignee, *Carroll Sound, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,261,584.—*Kenneth P. Browne* and *Bernard T. Carr,* Poughkeepsie, and *Edward J. Romanski,* Wappingers Fall, N.Y. HERMETIC SEAL. Patent dated Apr. 14, 1981. Disclaimer filed Jan. 21, 1982, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to claims 1–10 of said patent.

4,274,846.—*Michael L. Smith,* Atlanta, Ga. PARTICLE SIZING SAMPLER. Patent dated June 23, 1981. Disclaimer filed Jan. 25, 1982, by the assignee, *Andersen Samplers, Inc.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimers and Dedications

4,128,346.—*Evan L. Ragland, III,* Atherton, Calif. DAISY TYPE PRINT WHEEL APPARATUS. Patent dated Dec. 5, 1978. Disclaimer and Dedication filed Dec. 22, 1981, by the assignee, *Periphonic Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,153,060.—*Edward Korostoff,* Philadelphia, Pa., and *Zeev Davidovitch,* Cherry Hill, N.J. METHOD AND APPARATUS FOR ELECTRICALLY ENHANCED BONE GROWTH AND TOOTH MOVEMENT. Patent dated May 8, 1979. Disclaimer and Dedication filed Jan. 20, 1982, by the assignee, *University of Pennsylvania.*

The term of this patent subsequent to July 20, 1993, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 6, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-18-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-19-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-24-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-29-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-24-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-02-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	4-14-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-27-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-25-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-31-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	5-30-80

Expiration of patents: The patents within the range of numbers indicated below expire during February 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,167,778 to 3,171,130, inclusive

Plant Patents ..... Numbers 2,468 to 2,485 inclusive

REISSUES

MARCH 23, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,885
NOVEL DIAMIDE AND LUBRICANTS CONTAINING SAME

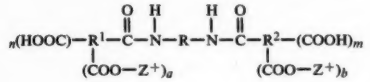
Walter E. Rieder, Arcadia, Calif., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Original No. 4,239,635, dated Dec. 16, 1980, Ser. No. 47,285, Jun. 11, 1979. Application for reissue Mar. 13, 1981, Ser. No. 243,455

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—34 **25 Claims**

1. A carboxylic acid group terminated polyoxyalkylene diamide and the alkali metal, ammonium or organic amine salt thereof having the following formula



wherein

R is the divalent polyoxyalkylene chain radical residue of an amine terminated polyoxyalkylene diamine absent the terminal amine groups,

R^1 and R^2 are the same or different and are selected from the group consisting of aliphatic, aromatic, cycloaliphatic, arylaliphatic, alkyl aromatic, thiodialiphatic [,] *or* halogen substituted aliphatic [or halogen substituted aromatic] radicals and having a free valence of a+n+1 and b+m+1 respectively,

Z is an organic amine cation, ammonium ion or alkali metal ion,

a is 0 to 3,

b is 0 to 3,

n is 0 to 3,

m is 0 to 3,

a+n is 0 to 3,

b+m is 0 to 3 and

a+b+m+n is 1 to 6.

3. A carboxylic acid group terminated polyoxyalkylene diamide and alkali metal, ammonium or organic amine salt thereof according to claim **1** wherein R^1 and R^2 are selected from the group consisting of aliphatic, aromatic, cycloaliphatic, thiodialiphatic [,] *or* halogen substituted aliphatic [or halogen substituted aromatic] radicals.

14. A metal working composition comprising (a) a substance selected from the group consisting of natural oil, synthetic oil and water and (b) from 0.01% to 99% by weight based on the total weight of the composition of a carboxylic acid group terminated polyoxyalkylene diamide or the alkali metal, ammonium or organic amine salt thereof according to claim **1**.

Re. 30,886
METHOD AND COMPOSITION FOR REDUCING BLOOD GLUCOSE LEVELS

Katsuya Ohata, Uji; Hiroshi Enomoto, Kyoto; Yoshiaki Yoshikuni, Kyoto; Tatsuhiko Kono, Kyoto, and Masahiro Yagi, Otsu, all of Japan, assignors to Nippon Shinyaku Company Ltd., Kyoto, Japan

Original No. 4,065,562, dated Dec. 27, 1977, Ser. No. 752,006, Dec. 20, 1976. Application for reissue Dec. 15, 1978, Ser. No. 969,785

Claims priority, application Japan, Dec. 29, 1975, 50-157425; Jan. 1, 1976, 51-239

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **6 Claims**

4. [An animal feed] *A comestible composition* comprising an amount of 2-hydroxymethyl-3,4,5-trihydroxypiperidine effective to *reduce blood glucose levels and* inhibit lipid biosynthesis in combination with an edible carrier.

Re. 30,887
FLAME RETARDANT POLYURETHANE FOAM

Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Original No. 3,817,881, dated Jun. 18, 1974, Ser. No. 340,277, Mar. 12, 1973. Continuation-in-part of Ser. No. 251,844, May 5, 1972, abandoned, which is a division of Ser. No. 8,040, Feb. 2, 1970, Pat. No. 3,707,586. Application for reissue Oct. 1, 1979, Ser. No. 46,980

Int. Cl.³ C08J *9/00*

U.S. Cl. 521—107 **12 Claims**

21. A polyurethane foam prepared from a reaction mixture comprised of a polyol, an organic polyisocyanate, a foaming agent, a reaction catalyst and a flame retardant additive consisting essentially of tetrakis(2-chloroethyl) ethylene diphosphate.

Re. 30,888
FERROIN REAGENT

Lawrence L. Stookey, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Original No. 3,770,735, dated Nov. 6, 1973, Ser. No. 49,579, Jun. 24, 1970. Application for reissue Oct. 17, 1979, Ser. No. 85,695

Int. Cl.³ C07D *401/04*

U.S. Cl. 544—182 **7 Claims**

1. 3-(2-pyridyl)-5,6-bis(phenylsulfonic acid)-1,2,4-triazine.

PLANT PATENTS

GRANTED MARCH 23, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,831

GAZANIA PLANT

Paul C. Enright, 11615 Riverside Dr., Lakeside, Calif. 92040

Filed Jun. 23, 1980, Ser. No. 162,183

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Gazania plant substantially as herein shown and described, characterized particularly as to novelty by its unique flower.

PATENTS

GRANTED MAR. 23, 1982

ERRATA

For CLASS	See PATENT NO.
441–004	4,320,545
441–074	4,320,546
060–667	4,320,663
122–013	4,320,702
434–074	4,321,037
376–250	4,321,110
376–353	4,321,111
524–526	4,321,168
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524–285	4,321,191
521–159	4,321,333
372–045	4,321,556
372–033	4,321,557
372–058	4,321,558
372–041	4,321,559

PATENTS

GRANTED MAR. 21, 1961

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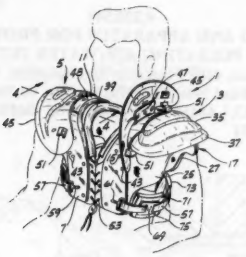
PATENTS

GRANTED MARCH 23, 1982

GENERAL AND MECHANICAL

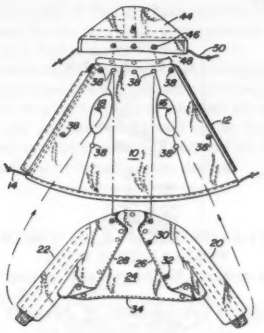
4,320,537
SHOULDER PAD
Hal D. Mitchell, Rolla, Mo., assignor to A-T-O Inc., Willoughby, Ohio
Filed Apr. 25, 1980, Ser. No. 143,917
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **10 Claims**



1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being a relatively rigid member of generally inverted U-shape as viewed from the side and having a chestplate portion, a backplate portion and an arch integrally connecting said plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie relatively closely adjacent the neck, each of said members having padding on the inside thereof with the padding at the top of the arch overlying the shoulder, and a pair of caps of relatively rigid material adapted to fit over the outer part of the shoulders and having shoulder padding on the inside thereof separate from said arch padding, the shoulder padding projecting laterally inwardly beyond the caps toward said neck opening, the inner edge of the shoulder padding being hinged to the arch padding via a padding-to-padding hinge connection for enabling the shoulder padding to swing upwardly relative to the arch padding whereby freedom is provided for raising the arms above a horizontal position by permitting upward movement of the arms at the shoulder without substantial interference from the shoulder padding.

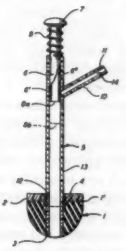
4,320,538
WEARING APPAREL
Gilbert Saft, 1524 Flat Rock Rd., Penn Valley, Pa. 19072
Filed Oct. 23, 1980, Ser. No. 199,760
Int. Cl.³ A41D *1/04, 1/00*
U.S. Cl. 2—102 **7 Claims**

1. Wearing apparel comprising an uninsulated vest having arms fixedly connected thereto, said arms being insulated by having a plurality of chambers containing insulating material,



the vest being adapted to be worn inside of a sleeveless insulated jacket.

4,320,539
DRAIN CLEARING DEVICE
Steven S. Li, 33 Essex St., New York, N.Y. 10002
Filed Feb. 9, 1981, Ser. No. 232,976
Int. Cl.³ E03D *11/00*
U.S. Cl. 4—256 **7 Claims**



1. A drain clearing device comprising:

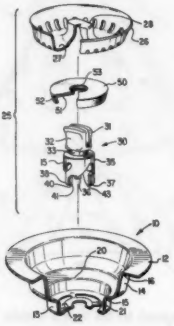
a drain sealing member with a central passage for sealing against a drain opening; and

a water supply device having an elongated pipe secured to said sealing member and communicating with said central passage in said sealing member, a side arm extending from an end of said pipe remote from said sealing member and communicating with said pipe for supplying water thereto, and a plunger valve having a hollow stem mounted in an end of said pipe remote from said sealing member and having a port in a wall thereof for selective alignment with said side arm, a knob at an end of said stem, and a spring positioned around said stem in abutment with said pipe for urging said stem out of said pipe.

4,320,540
DISCHARGE DRAIN ASSEMBLY

W. Hudson Leavens, Midland, Canada, assignor to Waltec, Inc., Ontario, Canada

Filed Nov. 3, 1980, Ser. No. 203,231
Claims priority, application Canada, Jul. 24, 1980, 356946
Int. Cl.[3] A47K *1/14;* E03C *1/262*
U.S. Cl. 4—287 1 Claim



1. A discharge drain assembly comprising:

(a) a thin-walled drain body for fitting into a discharge opening in a sink, said drain body comprising:

(i) an annular generally cup-shaped upper portion, said upper portion extending outwardly from a lower inner diameter to an upper outer diameter;

(ii) a generally cylindrical lower portion having a diameter substantially equal to said inner diameter and a bottom end adapted to be attached to a waste pipe;

(iii) an annular shoulder integrally attaching the upper end of said lower portion to said upper portion at said inner diameter;

(iv) three equi-angularly spaced radial bridges extending inwardly from said bottom end of said lower portion and defining annular openings; and

(b) a plug assembly adapted to fit relatively loosely in said drain body for limited rotational movement between an open position in which waste water is free to leave said sink through said waste pipe, and a closed position in which said plug assembly seals said water in said sink, said plug assembly comprising:

(i) a one piece perforated downwardly dished stainless steel strainer having an imperforate bottom portion from which an integral hollow oblong-shaped imperforate knob extends upwardly, said knob having opposed long sides which are inwardly concave;

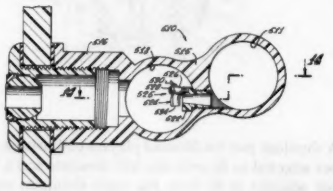
(ii) a spindle having a slotted head portion with inwardly concave opposed long sides, said head portion being adapted to be securely but releasably retained within said knob, said spindle having a neck portion below said head portion having a diameter less than the length of the long sides of the head portion, and a larger diameter generally cylindrical lower body portion divided into three equi-angularly spaced leg regions, each leg region including a straight downwardly extending lower leg portion engageable with a radial bridge of the sink basket to prevent rotation in one direction when the strainer is in an open position, a circumferentially extending flat portion adapted to rest on a bridge to hold said spindle in the open position, said flat portion being bounded on one side by a short cam portion adapted to lift said spindle upon rotation in a direction opposite to said one direction, and said short cam portion being followed by a relatively long cam portion which cooperates with a radial bridge to move said spindle downwardly when said spindle is rotated in said opposite direction, each said downwardly extending lower leg portion extending below said short and long cam portions;

(iii) a resilient sealing washer having a flat upper wall and a downwardly extending inwardly tapered outer skirt portion, said upper wall having a hole whereby the washer can be secured to the neck portion of the spindle by passing it over the head portion thereof, the skirt portion being adapted to seal against the shoulder portion of the drain body when the strainer is in the closed position.

4,320,541
METHOD AND APPARATUS FOR PROVIDING A PULSATING AIR/WATER JET

John S. Neenan, 4100 Mapeltree Dr., Anaheim, Calif. 92807

Filed Nov. 13, 1979, Ser. No. 93,754
Int. Cl.[3] A61H *9/00;* A47K *3/00;* B05B *1/08*
U.S. Cl. 4—492 36 Claims

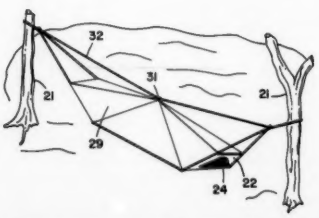


1. In a venturi type mixer wherein an increased velocity stream of liquid in a liquid conduit is projected through a jet nozzle into a mixing chamber and pulls gas from a gas conduit into the mixing chamber venturi b6 action for mixture with the liquid and discharge from the chamber, the improvement comprising apparatus for pulsing the discharge of liquid and gas from said chamber and decreasing the inflow of gas into the mixing chamber, said apparatus comprising means in said mixing chamber downstream of said jet nozzle for intermittently disturbing the flow of liquid in said chamber so as to intermittently disturb the venturi action and the pulling of gas into the chamber, whereby the discharge of liquid and gas from the chamber pulsates.

4,320,542
PORTABLE, SUSPENDED OUTDOOR SHELTER

Howard Cohen, 2001 Lincoln St., Berkeley, Calif. 94709

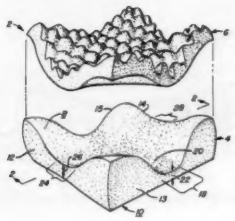
Filed May 27, 1980, Ser. No. 153,745
Int. Cl.[3] A45F *1/06, 3/22*
U.S. Cl. 5—121 14 Claims



1. A suspended, outdoor shelter, comprising a base panel having a pair of opposed, longitudinally extending edges; a pair of first sleeves formed in said base panel, each extending along one of said longitudinally extending edges; a pair of web members extending longitudinally, the medial portion of each secured to one of said edges of said base panel; a pair of longitudinally extending stiffening members, each secured in one of

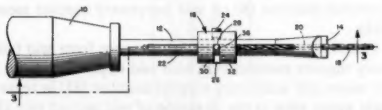
said first sleeves; means for urging said stiffening members outwardly each away from the other; and means for securing like ends of said web members to spaced apart support structures to suspend said shelter therebetween.

4,320,543
MEDICAL PILLOW
Linda H. Dixon, 5 Bon Air Rd., Larkspur, Calif. 94939
Filed Aug. 25, 1980, Ser. No. 181,281
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—434 **19 Claims**



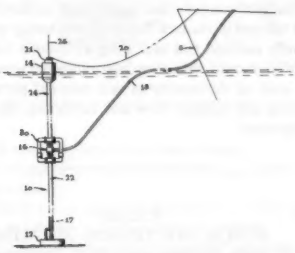
1. A medical pillow for supporting the head and neck of a person while in a generally horizontal position comprising:
- a resilient base having a contoured top, a bottom, and a circumferential side joining said top and bottom;
- said contoured top having a first, head supporting depression area at a first level and located generally centrally of said top, and having a second, neck supporting depression area at a second level and extending between said circumferential side and said first depression area, said second level being higher than said first level to provide vertical support to the head and neck; and
- said contoured top having a plurality of upwardly extending convolutions substantially covering said first and second depression areas, said convolutions being relatively soft to at least partially laterally surround the head and neck to resist movement of the head and neck.

4,320,544
COMBINATION DRILL AND SCREWDRIVER
Floyd C. Bryant, 900 Henley Pl., Charlotte, N.C. 28207, and James R. Smith, Rte. 3, Box 92, Waxhaw, N.C. 28173
Filed Oct. 17, 1979, Ser. No. 85,675
Int. Cl.³ B26B *11/00*
U.S. Cl. 7—158 **1 Claim**



1. A hand tool selectively configured for use as a drill, a screwdriver, and simultaneously as a drill and screwdriver when used with threaded fasteners having an axial bore comprising:
- a handle;
- a generally tubular shaft carried by said handle, said shaft being configured on the free end thereof for mating insertion into the groove in the head of a threaded fastener,
- said shaft having an axial bore extending from the free end thereof toward said handle, said shaft having a slot communicating with said bore along a portion of the length thereof intermediate the ends of said shaft;
- a generally L-shaped drill bit adapted for insertion into the bore of said shaft through said slot with the major portion thereof disposed in the bore and the butt end thereof extending out of said bore and through said slot; and
- a collar carried by said tubular shaft, said collar including means for engaging the butt end of said drill bit and for maintaining said collar and thereby said drill bit in a selected portion relative to said shaft thereby maintaining a predetermined axial extension of said drill bit from the free end of said shaft, so that the hand tool may be selectively configured for use as a drill, a screwdriver and simultaneously as a drill and screwdriver,
- said collar including an L-shaped slot having one end of one arm thereof open toward the free end of said shaft so that said collar and the butt end of said drill bit may be axially moved into position where said collar may be rotated about said shaft to position the butt end of said drill bit in the closed end of the other arm thereof.

4,320,545
EASILY REMOVABLE FLUID SWIVEL FOR SALM BUOY INSTALLATION
George M. Pomonik, Van Nuys, Calif., assignor to Amtel, Inc., Providence, R.I.
Filed Oct. 23, 1978, Ser. No. 953,710
Int. Cl.³ B63B *21/52, 51/02*
U.S. Cl. 441—4 **7 Claims**



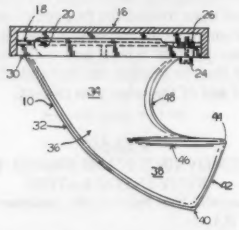
1. In a buoy installation of a type which includes an upper structure and a lower structure having a fluid conduit, the improvement of a product distribution assembly comprising:
- first and second product distribution units, each having a largely stationary portion and a rotatable portion;
- first and second valve means for controlling the flow of fluid therethrough;
- said units and valve means connected in a stack, with said first unit above said first valve means, said second valve means above said first unit, and said second unit above said second valve means;
- hose means for connecting said first valve means to said second valve means, said first valve means operable to direct fluid between said lower structure conduit and either said first unit or said hose means; and
- a tension transmitting device extending beside said product distribution units and connecting said upper and lower structures to hold said upper structure in place.

4,320,546
SURFBOARD
Carleton R. Knox, 4130 Harbor Dr., Carlsbad, Calif. 92008
Filed Jul. 23, 1979, Ser. No. 59,999
Int. Cl.³ A63C *15/00*
U.S. Cl. 441—74 **4 Claims**

1. A surfboard comprising:
(a) an elongated surfboard planing hull having a tail end portion;
(b) a fin fixed on the underside surface of said tail end portion and comprising a vertical hydrofoil having a rearwardly-downwardly extending leading edge and an arcuately

forwardly relieved portion in the upper part only of the trailing edge portion of the vertical hydrofoil, the lower part of said trailing edge portion being forwardly-downwardly swept; and

(c) wing hydrofoils fixed on and extending only rearwardly from a mid-portion of said vertical hydrofoil and extending bilaterally thereof to stabilize the surfboard when a surfer is taking off on a wave and to enhance laminar flow between said wing hydrofoils and said underside surface



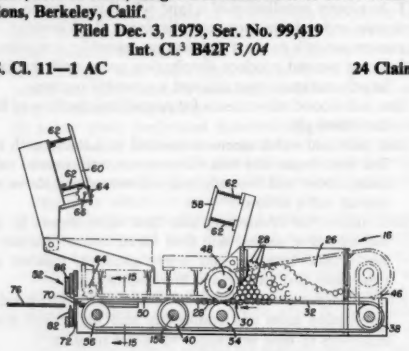
of the tail end portion and to produce a negative lift component in the tail end portion during forward movement of the surfboard in the water, said underside surface of said tail end portion of the surfboard being upwardly-rearwardly inclined and said wing hydrofoils being generally parallel thereto, said wing hydrofoils being substantially at the level of the bottom of said relieved portion, thus furthering said laminar flow and furthering the negative lift component.

4,320,547

PUNCH AND BINDING MACHINE

William H. Stolle, Belmont, and John C. Duderstadt, San Francisco, both of Calif., assignors to Mike Roberts Color Productions, Berkeley, Calif.

Filed Dec. 3, 1979, Ser. No. 99,419
Int. Cl.³ B42F 3/04
U.S. Cl. 11—1 AC **24 Claims**



1. A binding machine for inserting a comb-binding in a plurality of prepunched sheets comprising:

first holding means for holding said material;

second holding means for holding a comb-binding;

separate means for selectively extending and releasing the fingers of said comb-binding; and

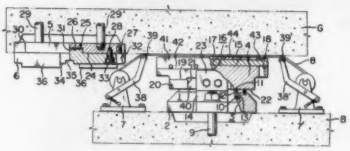
feed means for sequentially feeding comb-bindings toward said first holding means, said feed means including a plurality of flexible belts moving toward the first holding means, said driven belts spatially separated one from another a distance equal to a multiple of the separation of the fingers of one of the comb-bindings.

4,320,548

METHOD OF ERECTING A BRIDGE GIRDER

Hiroshi Tada, Yokohama; Wataru Abe, Hiratsuka; Toshiro Nozu, Zama, and Keizo Ishikawa, Yamato, all of Japan, assignors to Oiles Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1979, Ser. No. 55,320
Claims priority, application Japan, Jul. 7, 1978, 53-081972
Int. Cl.³ E01D 21/00
U.S. Cl. 14—1 **4 Claims**



1. A method for erecting a bridge girder comprising:

(a) affixing upon at least a first bridge pier, a support structure including a lower shoe (2), an upper shoe (4), a movable part (3) disposed between said lower and said upper shoe, a retaining member disposed between said lower and said upper shoe for preventing relative movement in the direction of a theoretical bridge axis which extends between said first bridge pier and a second bridge pier upon which said girder is intended to repose, said theoretical axis extending between said upper and lower shoe, a temporary support member (41) having a sliding member (44) temporarily fixed on said upper shoe, said temporary support member (41) having temporary fixing means, a movable member (8) disposed so as to move in the direction of said bridge axis on said sliding member (44);

(b) placing an elongated bridge girder with a sole plate (5) affixed thereto in a predetermined position on said movable member (8) pointing in the direction of said second pier;

(c) pushing out said bridge girder to a position near an installation position of said girder in the direction of said second pier along said theoretical bridge axis, together with said movable member (8) on said temporary support member (41);

(d) removing said temporary fixing means from said temporary support member (41) with said upper shoe to be able to move said temporary support member (41) in regard to said upper shoe in the direction of said second pier along said bridge axis, while attaching to said sole plate (5) a coupling member (6) which projects out from a lower surface of said girder in a position near an installation position of said bridge girder;

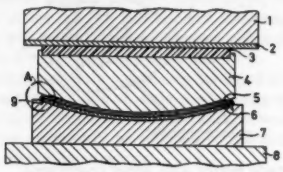
(e) thereafter again pushing out said girder and pushing out said temporary support member (41) on said upper shoe (4) by said coupling member (6) so as to displace said temporary support member (41) and said movable member (8) by said coupling member (6) on said upper shoe (4); and then,

(f) in said position, fixing said upper shoe (4) and said sole plate (5) in engagement with each other through said coupling member (6).

4,320,549
ROCKER-SLIDING BEARING ASSEMBLY AND A METHOD OF LINING THE ASSEMBLY

Gerhard Greb, Mücke, Fed. Rep. of Germany, assignor to Glacier GmbH-Deva Werke, Stadtallendorf, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,916
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829309
Int. Cl.³ B21D *53/10*; E01D *19/04*
U.S. Cl. 14—16.1 11 Claims

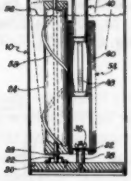


1. A rocker-sliding bearing for bridges or similar structures comprising:
a flat top plate;
an intermediate plate having a flat top side and a convex curved underside surface;
a bed plate;
a base plate having a correspondingly concave curved top side surface of a predetermined first radius of curvature secured to said bed plate;
a preformed curved disc of corrosion-resistant steel having a predetermined radius of curvature which is less than said first radius of curvature of said base plate top side surface positioned on the base plate; and
means for securing said steel disc to said base plate and for pressingly abutting said steel disc so as to conform to said predetermined first radius of curvature of said base plate top side surface.

4,320,550
PAINT ROLLER CLEANING APPARATUS

James McGrew, 7430-1/2 Girard Ave., La Jolla, Calif. 92037

Filed May 19, 1980, Ser. No. 151,359
Int. Cl.³ B05C *21/00*; B08B *1/00*
U.S. Cl. 15—3 10 Claims

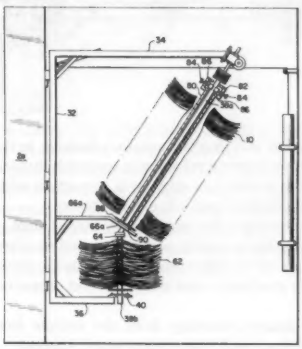


1. An apparatus for cleaning a paint roller comprising:
(a) a roller spinner;
(b) a solvent container;
(c) a cleaner bar mounted substantially upright in said container;
(d) detaining means in said container adjacent said cleaner bar for engaging the bottom of a roller inserted in said container and permitting at least limited angular movement of a roller thereon against said cleaner bar whereby a roller engaged on a roller spinner and engaged on said detainer means can be pivotally pressed against said bar and spun on said spinner in solvent in said container and against said cleaner bar, and subsequently removed on said spinner to be spun-dry in the container after the solvent is dumped.

4,320,551
ANGLED SIDE BRUSH VEHICLE WASHING APPARATUS

James W. Roncaglione, 806 Bridleridge Ct., Vienna, Va. 22180

Filed Feb. 7, 1980, Ser. No. 119,579
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 A 21 Claims



1. A vehicle washing apparatus, comprising:
(a) a frame member containing an opening adapted to receive the vehicle;
(b) means for causing relative movement in a first direction between said frame member and said vehicle;
(c) a pair of canted brush members rotatably disposed within said frame member on opposite sides thereof, each of said brush members being pivoted about a vertical axis, each of said brush members including a lower first brush rotatable about a substantially vertical axis of rotation for washing the lower vertical portions of said vehicle and a second brush rotatable about an axis of rotation inclined at an angle of about 15°–45° from the vertical for washing the upper side portions of said vehicle, the lower end of said lower brush being spaced from said corresponding vertical pivot axis a distance less than the upper end of said upper brush, the angle of inclination of said second brush being effective in preventing the tearing of antennas from said vehicle; and
(d) biasing means for biasing said opposing brushes toward each other to a first closed position whereby contact of the brushes with the vehicle is effected by the relative movement between said frame member and vehicle, said contact causing pivotal movement of said brush members to a second open position against said bias.

4,320,552
STREET SWEEPING MACHINE

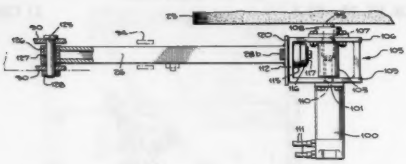
Donald L. Dickson, 1860 Arbolita Dr., La Habra, Calif. 90631, and Steven L. Dickson, 243 Long Branch Cir., Brea, Calif. 90621

Division of Ser. No. 80,532, Oct. 1, 1979, Pat. No. 4,308,632.
This application Dec. 8, 1980, Ser. No. 214,262
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—84 5 Claims

1. In a street sweeping machine including a wheeled vehicle, a main broom of generally cylindrical configuration disposed beneath the rearward end of the vehicle and having a supporting shaft extending transverse to the vehicle, and left and right

support arms generally horizontally disposed on respective sides of the vehicle and each having its forward end pivotally secured to the vehicle frame while its rearward end is coupled to a corresponding end of the broom shaft, improved means for supporting and rotatably driving the broom, comprising:

an auxiliary housing disposed adjacent the rearward end of one of said support arms, said auxiliary housing having an opening into which the associated end of said broom shaft extends, said auxiliary housing also having a bearing in said opening which rotatably receives said broom shaft;



pivot means securing said auxiliary housing to the rearward end of said associated support arm such that said auxiliary housing is able to rotate with respect to said associated arm about the longitudinal axis thereof;

a motor having a housing and an output shaft, said motor housing being rigidly secured to said auxiliary housing, and said motor output shaft being axially aligned with and rigidly coupled to said associated end of said broom shaft; and

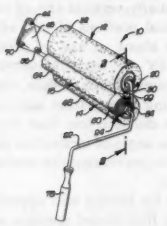
flexible means extending from the vehicle frame to said motor housing for supplying power thereto.

4,320,553

PAINT ROLLER ASSEMBLY

Robert T. Charles, 634 N. Kingsley Dr., Los Angeles, Calif. 90004

Filed Jun. 9, 1980, Ser. No. 157,256
Int. Cl.³ B05C *17/02*
U.S. Cl. 15—230.11 **15 Claims**



1. A paint roller assembly, comprising:

a roller support frame;

a pair of rollers mounted on said frame in spaced parallel relation, and rotatable with respect to parallel axes for independent rolling contact with a surface to be painted;

a third roller mounted with respect to said frame generally at one side of said pair of rollers and in parallel rolling contact with both of said pair of rollers for distributing paint between said pair of rollers and for substantially eliminating splatter of paint from said pair of rollers;

a handle member pivotally mounted with respect to said frame; and

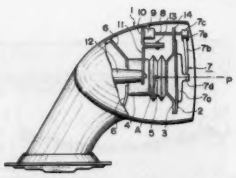
a friction clutch assembly mounted on said frame for applying an adjustable frictional force to resist pivoting motion of said handle member with respect to said frame for controllably stabilizing said pair of rollers with respect to said handle member.

4,320,554

OUTSIDE MIRROR WITH WIPER

Takeo Tamura, Yokohama, and Tatuo Nakamura, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd. and Ichiko Industries Limited, both of, Japan

Filed Jul. 24, 1980, Ser. No. 171,678
Claims priority, application Japan, Jul. 31, 1979, 54/96740
Int. Cl.³ B60S *1/08*
U.S. Cl. 15—250 B **4 Claims**



1. An outside mirror with wiper comprising:

(a) a mirror housing adapted for mounting on a vehicle;

(b) a mirror affixed to and supported by a mirror support member;

(c) vehicle operator-actuated remote control means mounted to said mirror housing and operably connected to said mirror support member for enabling the vehicle operator to pivotally adjust the position of said mirror about a mirror pivot point;

(d) a wiper having a wiper blade fitted to one end of a wiper arm in position to sweep across the surface of said mirror, and a wiper drive motor having a drive shaft fitted to the other end of said wiper arm for reciprocally pivoting said wiper arm about said other end of said wiper arm in the manner of a winshield wiper;

(e) wiper pivotal support means affixed within said mirror housing, said wiper drive motor being mounted on said wiper pivotal support means so that said wiper drive shaft rotatably swings about a substantially vertical axis extending through said mirror pivot point;

(f) said mirror support member having guide means acting on said wiper drive shaft for urging said wiper drive shaft to pivot in a substantially horizontal plane in substantial angular correspondence with the pivoting action of said mirror; and

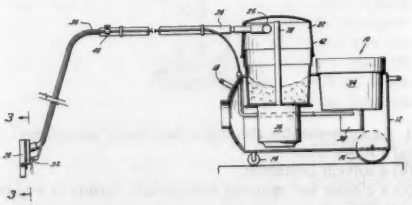
(g) biasing means on said wiper for constantly urging said wiper blade to press against and follow the surface of said mirror.

4,320,555

CONVERTIBLE VACUUM CLEANER

Charles F. Watson, 2606 Wentworth, Pasadena, Tex. 77506

Filed Apr. 21, 1980, Ser. No. 141,793
Int. Cl.³ A47L *7/00*
U.S. Cl. 15—321 **6 Claims**



1. Vacuum cleaner which can be used for dry dust-free vacuuming comprising:

(a) a suction head adapted to engage a surface to be vacuumed;

(b) a vacuum chamber including an inlet and outlet adapted

to hold a quantity of liquid and solid material, the chamber including means for preventing liquid and other material entering the chamber through the inlet from entering the outlet;

(c) means connected to the outlet for creating a partial vacuum in the chamber;

(d) a hose connecting the suction head and inlet for creating suction in the head and transporting material vacuumed from said surface to the chamber;

(e) a liquid conduit and liquid supply means for supplying liquid under pressure to the liquid conduit, the conduit connecting the liquid supply means with the hose so that liquid can be supplied from the liquid supply means to the interior of the hose so that material vacuumed from the surface will be combined with water before entering the chamber for dust-free operation; and

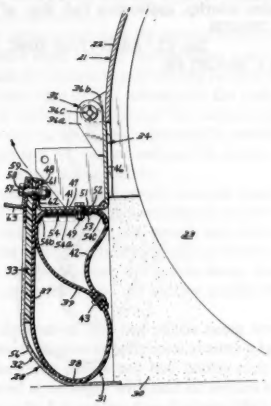
(f) means for selectively connecting the liquid supply means to a liquid nozzle with an outlet for spraying liquid on the surface to be vacuumed near the suction head, whereby liquid can selectively be supplied to the interior of the hose or to the liquid nozzle.

4,320,556

SURFACE MAINTENANCE EQUIPMENT

Paul W. Kimzey, St. Louis Park, and John L. Hanna, Deephaven, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Sep. 12, 1980, Ser. No. 186,705
Int. Cl.³ A47L 5/12
U.S. Cl. 15—347 **8 Claims**



1. Surface maintenance equipment comprising:

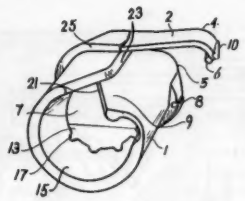
body structure and a plurality of wheels supporting said body structure, said body structure including a hopper, a downwardly opening housing defining a debris pickup chamber, and means for conveying debris from said pickup chamber to said hopper, said pickup housing including downwardly extending skirt means for partially sealing around the perimeter of said pickup chamber, at least a portion of said skirt means comprising in cross-section a substantially closed S-shaped stabilizing member and a vertically oriented skirt overlying said stabilizing member, said stabilizing member and skirt being comprised of a resilient material, whereby said stabilizing member resiliently urges said skirt into sealing engagement with the surface being maintained.

4,320,557

TUBE CLAMP

Robert Speedie, Frankston, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 18, 1980, Ser. No. 217,921
Claims priority, application Australia, Dec. 21, 1979, PE1823
Int. Cl.³ A22B 5/14
U.S. Cl. 17—1 R **10 Claims**



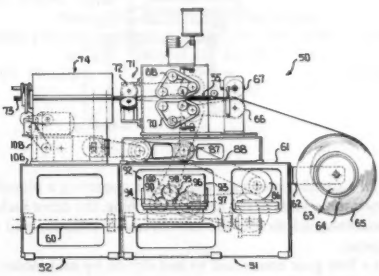
1. A tube clamp for substantially closing a flexible tube, including a quasi-tubular member having a slot extending through the side wall from one end to the other so as to enable the quasi-tubular member to be applied to a tube at a position between the ends of the tube and means in the quasi-tubular member for applying a clamping pressure upon portion of the tube within the clamp and means for locking the clamp against inadvertent release from the flexible tube.

4,320,558

CONTINUOUS SHIRRING AND SPINNING MACHINE FOR CASINGS

Harold H. Martinek, Danville, Ill.; Thomas W. Martinek, Covington, Ind., and Alfred D. Story, Danville, Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,887
Int. Cl.³ A22C 13/02
U.S. Cl. 17—42 **9 Claims**



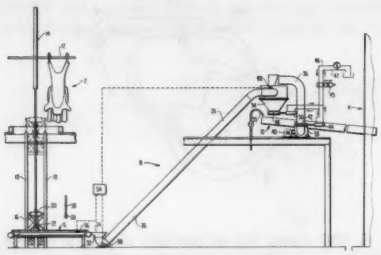
1. A machine for continuously shirring and spinning a casing for sausage and the like, said machine comprising an elongated mandrel, feed means for advancing a casing along said mandrel at a selected rate, shirring means for continuously shirring the fed casing, spinning means for continuously spinning the continuously shirred casing, and density control means for continuously controlling the advance of the shirred casing, and separating means for separating the continuously shirred and continuously spinning casing into strands of preselected lengths downstream of said spinning means.

4,320,559

ANIMAL HIDE CONVEYING METHOD AND APPARATUS

William F. Couture, Amarillo, Tex., assignor to Iowa Beef Processors, Inc., Dakota City, Nebr.

Filed Dec. 7, 1979, Ser. No. 102,005
Int. Cl.³ A22B 5/00, 5/16
U.S. Cl. 17—50 30 Claims



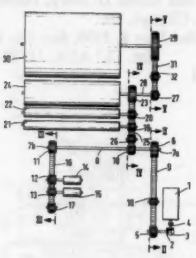
24. The method of claim 22 having a gate at the hide discharge opening, and moving said gate from a closed position to an open position to permit hides to fall from said chamber.

4,320,560

DRIVE FOR A PLURALITY OF ROTARY CARDING COMPONENTS

Wolfgang Beneke, and Jürgen Klüttermann, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,515
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904852
Int. Cl.³ D01G 15/26, 15/36
U.S. Cl. 19—98 11 Claims



1. In a carding machine, a drive for operating a plurality of rotary components of the carding machine; the drive including a variable-speed motor; the improvement wherein said drive comprises

(a) a first gear connected to and driven by said motor;

(b) a first shaft;

(c) a second gear affixed to said first shaft;

(d) first slip-free force transmitting means drivingly connecting said first and second gears to one another, whereby said first gear rotates said first shaft by means of said second gear;

(e) a third gear affixed to said first shaft, whereby said first shaft drives said third gear;

(f) fourth and fifth gears connected to respective calender rollers of the carding machine;

(g) second slip-free force transmitting means drivingly connecting said third, fourth and fifth gears to one another, whereby said third gear rotates said calender rollers by means of the respective said fourth and fifth gears;

(h) a sixth gear affixed to said first shaft;

(i) seventh and eighth gears connected to respective squeezing rollers of the carding machine;

(j) a second shaft connected to a take-off roller of the carding machine;

(k) a ninth gear affixed to said second shaft;

(l) a third slip-free force transmitting means drivingly connecting said sixth, seventh, eighth and ninth gears to one another, whereby said sixth gear rotates said squeezing rollers and said take-off roller by means of the respective said seventh, eighth and ninth gears;

(m) a tenth gear affixed to said second shaft;

(n) an eleventh gear connected to a doffer of the carding machine; and

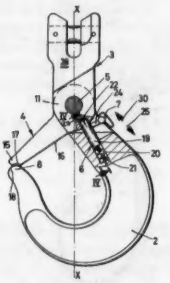
(o) a fourth slip-free force transmitting means drivingly connecting said tenth and eleventh gears to one another, whereby said tenth gear rotates said doffer by means of said eleventh gear; said calender rollers, said squeezing rollers, said take-off roller and said doffer being comprised in said rotary components.

4,320,561

HOOK, ESPECIALLY SAFETY LOAD HOOK

Anton Müller, Aalen-Unterkochen, and Peter Kromer, Aalen-Hofherrnweiler, both of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,629
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854528
Int. Cl.³ A44B 13/02; B66C 1/36
U.S. Cl. 24—241 PS 17 Claims



1. A hook, especially a safety load hook, comprising in combination:

a hook body having a receiving opening adapted to receive a chain member therein, said hook body having a free hook-mouth end adjacent said receiving opening;

a fork head pivotally connectible to said hook body and including a crosspiece with a pivot element provided therewith for pivotal connection of said fork head and said hook body crosspiece being provided with limiting surfaces above and below the pivot element, converging toward the free hook mouth end;

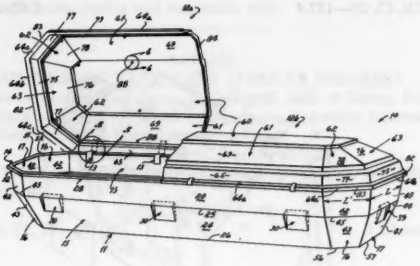
a closure element operatively connected to said fork head for closing off said receiving opening; and

a blocking device for holding said closure element in a closed position at said free hook-mouth end of said hook body.

4,320,562
NESTABLE CASKET

Robert J. Kelley, 3245 Stettinius Ave., Cincinnati, Ohio 45208

Filed Jun. 13, 1980, Ser. No. 159,159
Int. Cl.³ A61G 17/00
U.S. Cl. 27—2 11 Claims



1. A casket comprising,

a tub section, said tub section having side walls and end walls structured and configured to permit nesting of similar tub sections one within another, and

a lid section, said lid section comprising two substantially identical half lid sections, said lid section being shallower in depth than said tub section, said lid section being removable from normal closed casket configuration with said tub section, said lid section being structured and configured to permit nesting of similar lid sections one within another, and being so configured that, upon inversion of said lid section relative to said tub section, said lid section can be received in nesting relation substantially interiorly of said tub section,

each of said tub section and said lid section comprising a peripheral closure edge, said lid section being supportable interiorly of said tub section in said nesting relation at said peripheral closure edge of said tub section, the peripheral closure edge of each of said tub and lid sections defining phantom edge planes which are substantially parallel one to another when said tub section and said lid section are in normal casket closed configuration,

said tub section comprising side panels and end panels disposed adjacent said tub section's peripheral closure edge,

said lid section also comprising side panels and end panels located adjacent said lid section's peripheral closure edge,

said tub section side panels and end panels being inwardly tapered at an angle from said tub section peripheral closure edge,

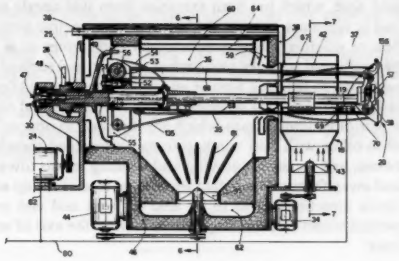
said lid section side panels and end panels being inwardly tapered from said lid section peripheral closure edge, and said lid section's side panels and end panels each being inwardly tapered at an angle with said lid section's phantom edge plane which is not less than the inwardly tapered angle defined by the adjacent one of each of said tub section's side panels and end panels with said tub section's phantom edge plane when said tub section and said lid section are in closure relation, and

said tub section further comprising side transition panels and end transition panels, said lid section also comprising side transition panels and end transition panels, said tub section's transition panels each defining an inwardly tapered angle with said tub section's phantom edge plane which is greater than the inwardly tapered angle defined by respective adjacent side panels and end panels of said tub section, and said lid section's transition panels each defining an inwardly tapered angle with said lid section's phantom edge plane which is greater than that angle defined by respective adjacent side panels and end panels of said lid section.

4,320,563
DEVICE FOR CONTINUOUSLY RELAXING YARNS

Armando D'Agnolo, Pordenone, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Feb. 26, 1979, Ser. No. 14,830
Claims priority, application Italy, Feb. 24, 1978, 83334 A/78
Int. Cl.³ D02G 1/20
U.S. Cl. 28—248 12 Claims

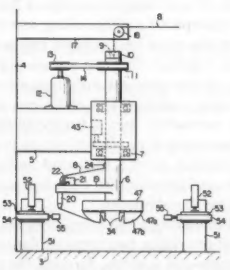


1. Device for the continuous relaxing of synthetic yarn, comprising a rotatable distributor carrying in a coordinated manner in torsional equilibrium and activated lengthwise several horizontal closed rotating rings, said rotatable distributor applying coils of yarn about said closed rotating rings to form a yarn reserve thereon, a relaxing oven having an outlet, said relaxing oven enclosing at least part of the rotating distributor, air movement means at the outlet of the oven to invest the coils of yarn by a current of air, fixed means to guide coils of yarn on at least an initial tract of the closed rings, means to heat gaseous fluid, means to force circulation of the gaseous fluid in said relaxing oven, means to adjust the vertical distance between the closed rings, fixed means to deform partially the coils of yarn cooperating with the closed rotating rings and adjacent an end tract thereof, means to control the position of the reserve of yarn adjacent said end tract and means for unwinding yarn from the closed rotating rings.

4,320,564
COIL WINDING MACHINE

Masaaki Aida, Yokohama; Takashi Kobayashi, Fujisawa, and Hiroshi Saitoh, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,924
Claims priority, application Japan, Nov. 20, 1978, 53-142394
Int. Cl.³ H01F 41/06; H02K 15/08
U.S. Cl. 29—33 L 6 Claims



1. In a coil winding machine for winding coils on a core of a dynamoelectric machine, said coil winding machine having a rotary shaft, a flyer carried by one end of said rotary shaft and adapted to be rotated around said core which is located beneath said rotary shaft, and at least one guide disposed on the outer peripheral surface of said core, said guide being adapted

to guide the wire which is continuously extracted from said nozzle as said flyer is rotated, such that said wire is laid in a pair of slots formed in said core thereby to form coils around said core,

an improvement which comprises: a former rotatably carried by the lower end of said rotary shaft and having a pair of guide surfaces projecting to oppose to the end surface of said core, said former being adapted to guide and direct said wire, which has been extracted from said nozzle and laid in said slots, toward the bottoms of respective slots; a pair of winding frames supported by said former so as to be positioned between said former and said end surface of said core, so that said wire of said coil formed by said flyer is wound round said winding frames to form an end coil; a pair of bending means which are disposed to oppose to each other with said winding frames interposed therebetween; and means for moving said bending means toward and away from said winding frames and also in the up and down directions so as to be able to bend said end coil wound round said winding frames toward the axis of said core.

4,320,565

BEARING COMPONENTS AND METHOD OF MAKING SAME

Henry A. Warchol, 2 Sackville Ave., Westfield, Mass. 01085

Division of Ser. No. 876,899, Feb. 13, 1978, Pat. No. 4,212,095. This application May 13, 1980, Ser. No. 149,325

Int. Cl.³ B21D *53/12*; B32K *1/05*

U.S. Cl. 29—148.4 C **3 Claims**

1. A method of making a ball and roller bearing cage comprising the steps of: providing two strips of flat stock each with a plurality of equi-spaced scallops along one edge of the strip, forming each of the strips into a closed ring with the confronting edges fused together, forming a main portion of the non-scalloped edge of one ring inwardly into a frustoconical configuration, forming a main portion of the non-scalloped edge of a second ring outwardly into a frustoconical configuration, forming the frustoconical portion of the rings into a flat planar configuration normal to the scalloped surfaces, joining together the two configurations for defining spaced roller or ball receiving pockets therebetween.

3. A method of making a ball or roller bearing cage comprising the steps of: providing two strips of flat stock each with a plurality of equispaced scallops, forming the opposite edge of the strip downwardly in a plane normal to the scalloped surface, forming the scalloped surface of one piece into a unitary ring with the uninterrupted continuous normal edge assuming a smaller diameter, forming the scalloped surface of the other strip into a unitary ring with the uninterrupted continuous normal edge assuming a larger diameter, and joining together the two rings with the balls or rolls confined between.

4,320,566

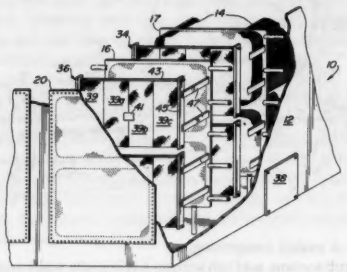
METHOD OF RETROFITTING A HEAT EXCHANGER

Robert C. Boyer, Emmaus; George Williams, Chalfont, and Herbert A. Wessner, Easton, all of Pa., assignors to Ecolaire Incorporated, Malvern, Pa.

Filed Jun. 2, 1980, Ser. No. 155,342

Int. Cl.³ B23P *15/26, 19/00*

U.S. Cl. 29—157.4 **8 Claims**



1. A method of retrofitting a exchanger having heat exchange tubes within an outer shell comprising removing old heat exchange tubes, attaining access to an area between existing support plates disposed within the shell, introducing panel modules into said area, assembling a tube support panel from said modules in said area, aligning holes in the panel with holes in the tube support plates, securing the panel in place at said area, retubing said shell with new heat exchange tubes using holes in the support plates and holes in the panel, and spacing the midspan of adjacent tubes from each other by said panel to inhibit midspan collision of tubes between adjacent support plates.

4,320,567

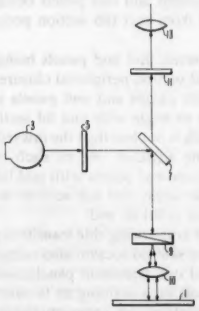
OPTICAL INSPECTION METHOD FOR DETERMINING MACHINABILITY

Pierre V. Valembois, Cranbury; Cheryl A. Deckert, Princeton, and Edward J. Holub, Hamilton Square, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,687

Int. Cl.³ B23Q *17/00*; G01N *21/88*

U.S. Cl. 29—407 **3 Claims**



1. A method for selecting a medium for use in an electromechanical recording apparatus wherein a stylus is used to cut a groove modulated by a video signal on said medium, comprising the steps of:

coating a surface of a foundation with a layer of metal;

machining said layer of metal such that said coated surface of said foundation is substantially planar;

inspecting said machined surface for depressions with a microscope using a differential interference contrast technique; recording the number of depressions observed during said inspection step to establish an indication of the machinability of said coated foundation; and

selecting said coated foundation for further processing and subsequent use in said electromechanical recording apparatus based upon the number of depressions observed and recorded during said inspection step.

4,320,568

METHOD OF EXPANDING TUBULAR MEMBERS

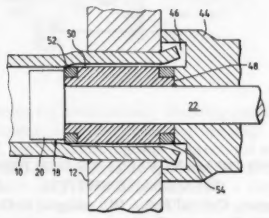
Clive A. Herrod, and James G. Campbell, both of Derby, England, assignors to Northern Engineering Industries Limited, Newcastle upon Tyne, England

Filed Jan. 22, 1981, Ser. No. 227,359

Claims priority, application United Kingdom, Feb. 14, 1980, 04987/80

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—421 R **7 Claims**



1. A method of expanding a tubular member within a tubeplate comprising a first stage in which the tube is expanded into contact with the tubeplate using a first body of elastomeric material to stress the tube beyond its elastic limit and a second stage in which the tube is expanded using a second body of elastomeric material having a dimension different from a corresponding dimension of the first body to stress beyond their elastic limits the tube and an annular zone of the tubeplate around the tube.

4,320,569

METHOD OF FABRICATING A SHEATH FOR A KNIFE

Lowell H. Todd, Sr., 324 Green Dr., Pasadena, Md. 21122

Division of Ser. No. 91,387, Nov. 5, 1979, Pat. No. 4,263,714. This application Sep. 16, 1980, Ser. No. 187,645

Int. Cl.³ B21D *35/00*

U.S. Cl. 29—469.5 **3 Claims**

1. A method of fabricating a sheath device for a hunting knife assembly of a type adapted to encompass the blade of the hunting knife while leaving the handle portion thereof open ready for access, which comprises the steps of: forming a blank for an envelope like rigid metal former member for the blade portion of the knife; forming an extension from the aforementioned portion which is of a configuration adapted to close in a substantial loop of a character adapted for reception of a belt therethrough; covering all surfaces of the blank for the rigid former member with thin sheet leather, cutting the excess surfaces or areas of the leather beyond the configuration of the rigid former member after allowing a margin for riveting or stapling or stitching along the edges thereof, bending said blank to form said envelope like rigid metal former member with lapped marginal edges, joining said lapped edges by riveting, stapling or stitching and which comprises the additional step of cementing all surfaces of the leather to all surfaces contiguous with the metal former.

4,320,570

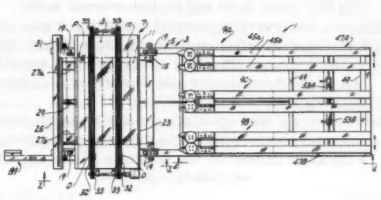
APPARATUS FOR DISASSEMBLING WOODEN PALLETS

Lonnie M. Williams, Roodhouse, Ill., assignor to Williams Panel Board Company, Roodhouse, Ill.

Filed Nov. 5, 1979, Ser. No. 91,517

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—564.3 **42 Claims**



2. Apparatus for disassembling wood pallets or the like, said pallets comprising a nailed together wood structure having a plurality of spaced stringers and a plurality of slats nailed to the stringers and extending transversely thereof, said apparatus comprising:

a frame;

means mounted on said frame for reciving a pallet to be disassembled;

a plurality of nail cutting means, one for a respective stringer, said nail cutting means being adapted to cut the nails holding the slats to a respective stringer;

means for effecting relative movement of said pallet receiving means with said pallet thereon and said nail cutting means;

means for holding said pallet on said pallet receiving means in position with its stringers extending parallel to the direction of movement of said pallet receiving means; and

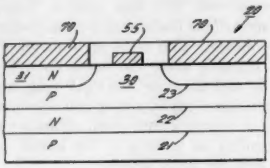
means for adjustably moving in transverse direction at least some of said nail cutting means so as to align certain of said nail cutting means with a respective stringer of said pallet, each of said nail cutting means being supported on an elongate, cantilever support, and each of said adjustably movable nail cutting means including means for self-centering said adjustably movable nail cutting means relative to its respective stringer upon effecting cutting of said nails.

4,320,571

STENCIL MASK PROCESS FOR HIGH POWER, HIGH SPEED CONTROLLED RECTIFIERS

James H. Hauck, Hermosa Beach, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Oct. 14, 1980, Ser. No. 196,684
Int. Cl.³ H01L 21/28
U.S. Cl. 29—591 7 Claims



1. The process of manufacture of a high power semiconductor device comprising the steps of:

forming an interdigitated emitter region and gate region which terminate on an elongated junction extending over one surface of a semiconductor wafer;

forming a first metal layer atop the full area of said one surface;

removing an elongated region of said first metal layer from a thin elongated region spanning across said junction at said one surface to define separate emitter and gate region contacts;

forming a photoresist mask over the portion of said one surface exposed by said thin elongated region of metal removed from said first metal layer and over said first metal layer atop said gate region;

forming a second metal layer atop the full exposed area of said first metal layer and said photoresist mask;

sintering the overlying second metal layer into said first metal layer to define an emitter contact of thickness equal to the combined thickness of said first and second metal layers; and decomposing said photoresist mask during said sintering step;

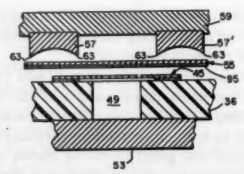
and removing the region of said second metal layer from atop said photoresist mask to define a gate contact having a thickness defined by the thickness of said first layer.

4,320,572

DIE-STAMPED CIRCUIT BOARD ASSEMBLY HAVING RELIEF MEANS-METHOD OF MAKING

Boyd G. Brower, and John W. Shaffer, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 19, 1980, Ser. No. 131,614
Int. Cl.³ H01H 11/00
U.S. Cl. 29—832 9 Claims



1. A method of making a circuit board assembly for use in a photoflash device wherein said assembly includes a dielectric substrate, at least one switching element, and at least one electrical ocnductive member, said method comprising:

positioning said switching element at a predetermined location on a first surface of said substrate;

positioning said dielectric substrate on a base member;

orienting a thin strip of electrically conductive material over said dielectric substrate and said switching element;

engaging said thin strip of conductive material with a die member so as to press preselected portions of said conductive material and said switching element into said dielectric substrate sufficiently to secure said preselected portions of said conductive material and said element thereto and electrically connect said preselected portions of said conductive material and said element, said preselected portions of said conductive material pressed within said dielectric substrate defining said conductive member, said pressing of said preselected portions of said conductive material and said switching element deforming or severing at least one part of said switching element; and

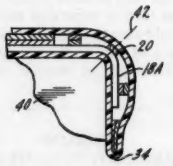
removing the non-pressed remainder of said electrically conductive material from said substrate material.

4,320,573

METHOD OF MANUFACTURE FOR BENDABLE MEMBRANE SWITCH

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed May 30, 1980, Ser. No. 154,913
Int. Cl.³ H01H 11/00
U.S. Cl. 29—622 7 Claims



1. In a membrane switch of the type mounted on a base in cantilevered fashion and actuated by bending the cantilevered end of the switch along a line of bending, an improved method of manufacturing said switch, comprising the steps of:

(a) preparing an elongated, generally rectangular blank of flexible sheet material;

(b) applying to a first portion of said blank, a first conductor including two spaced electrodes extending along the length of said blank, and applying to a second portion of said blank, a second conductor including a single electrode extending laterally to the first conductor and along the line of bending, both the first and second conductors being applied in liquid form to the same side of the blank;

(c) applying to said blank, an insulative spacing means including a pair of spacer bars, one on either side of the second conductor, and another pair of spacer bars arranged on the first portion of the blank so as to make the spacing means symmetrical about a line dividing the first and second portions of the blank, both pairs of spacer bars being applied in liquid form to the same side of the blank;

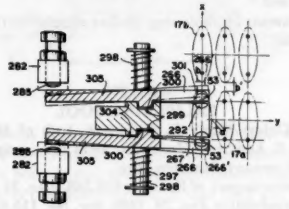
(d) applying adhesive to the blank;

(e) folding the second portion of the blank over the first portion such that the spacer bars are aligned, with the adhesive holding the portions together.

4,320,574
INSERTING ASSEMBLY FOR AUTOMATICALLY INSERTING PARALLEL LEAD ELECTRONIC COMPONENT INTO OPENINGS IN A PRINTED CIRCUIT BOARD

Kotaro Harigane, and Tetsuro Ito, both of Tokyo, Japan, assignors to Tokyo Denki Kagaku and Kogyo Kabushiki Kaisha, both of, Japan

Filed Feb. 20, 1980, Ser. No. 122,864
Claims priority, application Japan, Feb. 21, 1979, 54-19488
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—741 **3 Claims**



1. In apparatus for automatically inserting parallel lead electronic components into lead receiving openings in a printed circuit board, and wherein x, y and z directions are defined in a manner such that in an imaginary plane which intersects the leads and which is orthogonal thereto, the x direction is defined by the direction of a line extending between the points of intersection of the plane and the leads, the y direction is the direction in the plane which is perpendicular to the x direction, and the z direction is the direction perpendicular to the plane, the improvement comprising:

a frame;

lead holding and guiding means associated with said frame for holding and guiding the electronic components, said lead holding and guiding means including a guiding member having two side surfaces and an end portion mounted for rotation about an axis of rotation extending in the x-direction and for longitudinal movement extending in the z-direction, and a pair of holding members each having respective inner surfaces disposed at a respective one of said guiding member side surfaces, such that said side surfaces of said end portion of said guiding member and the respective inner side surfaces of said holding members constitute lead holding and guiding portions; and wherein each of said side surfaces of said guiding member has a groove formed therein extending substantially parallel to a line in a plane defined by the y-z directions, each of said holding members has a protrusion formed thereon extending substantially parallel to a line in a plane defined by the y-z directions, and wherein each of said protrusions are relatively loosely received in a corresponding one of said grooves whereby said holding members are mounted for a limited rotation relative to said guiding member about respective axes of rotation which extend parallel to a line in a plane defined by the y-z directions; whereby said lead holding and guiding portions can be opened and closed as said holding members are rotated.

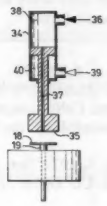
4,320,575
APPARATUS FOR MANUFACTURING CANDLES

Lars H. Karlsson, Köpmansgatan 17, 82060 Delsbo, Sweden

Division of Ser. No. 955,613, Oct. 30, 1978, abandoned. This application Apr. 11, 1980, Ser. No. 139,183
Int. Cl.³ B23P *21/00, 19/00*
U.S. Cl. 29—788 **8 Claims**

1. An apparatus for manufacturing heating candles having a candle wax composition, a wick and a wick holder with a hole in a neck portion thereof, said apparatus including a wick advancing means for supplying wick yarn through the hole in the neck portion of the wick holder to form a wick holder and wick assembly and for supplying yarn through a hole through the candle wax composition, and mating means for mating the wick holder and wick assembly with the candle wax composition into abutment with each other after the wick is positioned to extend through the neck portion and the hole in the candle wax composition, said mating means comprising:

a compressed air-operated piston device with a front surface arranged to aid in the positioning of the wick holder and



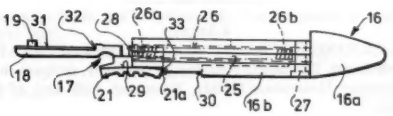
wick assembly into abutment against the candle wax composition when the piston device is actuated by compressed air from a compressed air source;

said piston device including a compressed air duct operatively arranged to direct a jet of air against the wick holder and wick assembly in a direction towards the candle wax composition when the piston device is actuated by compressed air, said jet of air being of a predetermined force to displace the wick holder and wick assembly into abutment against the candle wax composition.

4,320,576
RAZOR KNIFE WITH SELF-RETRACTING BLADE

Ewald H. Beermann, Solingen, Fed. Rep. of Germany, assignor to Firma Martor-Argentax E. H. Beermann KG, Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 928,379, Jul. 27, 1978, abandoned. This application May 2, 1980, Ser. No. 146,333
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736395
Int. Cl.³ B26B *3/06*
U.S. Cl. 30—162 **8 Claims**



1. A razor knife comprising:

an elongated housing having a front end, a longitudinally forwardly open and longitudinally extending guide, a longitudinally extending and transversely open slot, and a longitudinally forwardly directed holding face;

a blade holder in said housing having a seat for a razor blade;

an actuator exposed at said slot, accessible from outside said housing, and having a longitudinally rearwardly directed actuator face fixed longitudinally relative to said seat, said actuator and holder being longitudinally joined and jointly longitudinally slidable in said guide between a back position with said blade wholly enclosed in said housing and with said actuator face longitudinally behind said holding face and a front position with said blade projecting at least partly longitudinally forwardly from said front end of said housing and with said actuator face slightly longitudinally forward of said holding face, said actuator further being transversely shiftable in said housing be-

tween an outer releasing position with said actuator face longitudinally out of line with and capable of longitudinally passing said holding face and an inner holding position with said actuator face longitudinally in line with and incapable of longitudinally passing said holding face;

a spring braced between said holder and said housing and urging said holder and said actuator longitudinally backwardly in said housing toward said back position with a relatively great force; and

biasing means between said actuator and said holder for urging said actuator outwardly toward said outer position with a relatively small force.

4,320,577

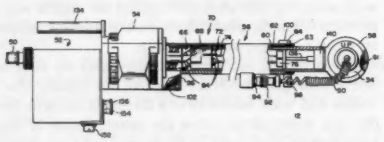
AUTOMATIC READOUT MICROMETER

Ted Lauritzen, Lafayette, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 4, 1979, Ser. No. 45,170

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 A **13 Claims**



1. An apparatus for taking measurements including:

a first arm;

a second arm;

means for mounting the second arm telescopingly to the first arm;

means for impositively positioning the second arm with respect to the first arm wherein said impositively positioning means includes means including a threadless nut assembly for slipping varying the position of said second arm with respect to said first arm and means including coarse and fine adjustment means for rollingly varying the position of said second arm with respect to said first arm; and

means for electronically measuring the change in position of the second arm with respect to said first arm.

4,320,578

MEASURING INSTRUMENT MOUNTING APPARATUS

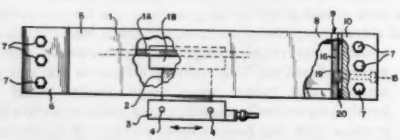
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,157

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853771

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 T **10 Claims**



1. In a length measuring instrument for measuring the relative position of a first object with respect to a second object, the first object forming a mounting surface, the instrument having a scale, a scanning unit mounted to scan the scale, and a stiff housing having a first and a second mounting section, the housing carrying the scale and the scanning unit, an improved mounting apparatus comprising:

means for mounting the scale to the housing such that the longitudinal position of the scale is determined by the housing;

first means for fixedly mounting the first mounting section of the housing to the mounting surface;

a flex member, attached to the second mounting section of the housing, the flex member being flexible but inelastic in a direction longitudinal with respect to the length of the housing defined by the first and second mounting sections, and rigid in directions transverse to the longitudinal direction; and

second means for mounting the flex member to the mounting surface.

4,320,579

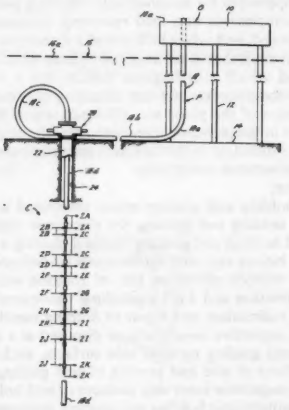
CALIPERING TOOL

John C. Kinley; Harry E. Dieckman, both of Houston, and Clifford E. Anderson, Huntsville, all of Tex., assignors to J. C. Kinley Company, Houston, Tex.

Continuation-in-part of Ser. No. 108,388, Dec. 31, 1979. This application Jan. 29, 1980, Ser. No. 116,610

Int. Cl.³ G01B *5/12, 5/28*

U.S. Cl. 33—178 R **33 Claims**



1. In a calipering tool for use in a pipe and having a body and feeler means with the body for engaging the internal surface of the pipe being calipered, the feeler means for moving in response to variations in the surface of the pipe, the improvement residing in the body being formed of multiple body sections, the body having means therewith for permitting the body to be pumped in response to fluid pressure thereon into the pipe for operation thereof; the body having articulating means with the body sections for permitting the body sections to articulate with respect to each other as the body sections pass through a curved section of the pipe.

4,320,580

METHOD AND DEVICE FOR DETERMINING THE POSITION OF A CUTTING TOOL RELATIVE TO THE ROTATIONAL AXIS OF A SPINDLE-MOUNTED WORKPIECE

Richard R. Williams, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 3, 1980, Ser. No. 183,780

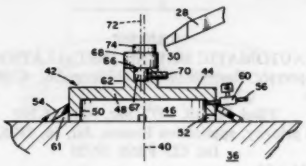
Int. Cl.³ B24B *17/00;* B27G *23/00;* B66C *1/02*

U.S. Cl. 33—185 R **4 Claims**

1. A device for determining the position of the cutting tool

with respect to the axis of rotation of a workpiece-supporting spindle in a machine tool, said device comprising

a concave body disposed at a location intersected by said axis in an abutting relationship with a surface portion of one of said workpiece and said spindle and defining a cavity therewith, seal means attached to said body for closing said cavity while in said abutting relationship,



conduit means in registry with said cavity and a source of vacuum for evacuating the cavity and maintaining the concave body in said abutting relationship, and

a machinable pin means carried by said body and projecting along a plane encompassing said axis and adapted to be contacted and machined into a cylinder by said cutting tool with the radius of the machine cylinder being equal to the distance of the cutting surface of the tool in contact with said cylinder from said axis.

4,320,581

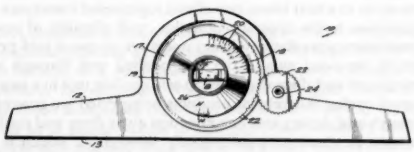
LEVELING

Karl B. Ousterhout, Kosciusko, Miss., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed May 29, 1980, Ser. No. 154,296

Int. Cl.³ G01C *9/28*

U.S. Cl. 33—388 **14 Claims**



13. A level mechanism comprising

a frame including an elongated straight edge and a circular bore extending therethrough having an axis perpendicular to said straight edge; a first annular member mounted coaxially with said bore and received at least in part within said bore; a second annular member coaxial with said first annular member and received at least in part within said first annular member; a spirit level tube; a third annular member coaxial with said bore and having a rim portion and a hub portion standing proud from said rim portion, said hub portion received at least in part within said first annular member and said bore and supporting said level tube, and said rim portion having a diameter larger than the diameter of said circular bore, and said rim portion abutting said frame; and a plurality of fasteners for affixing said third annular member to said second annular member.

4,320,582

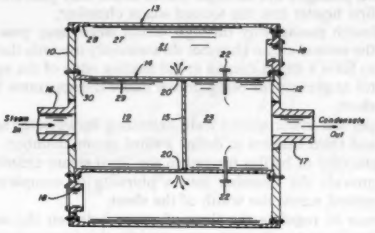
YANKEE DRYER AND METHOD OF FABRICATION

Karl H. Klippstein; Joseph Sawdai; Charles A. Schacht, all of Pittsburgh, and Charles G. Schilling, Murrysville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 18,963, Mar. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 794,291, May 5, 1977, abandoned. This application Apr. 28, 1980, Ser. No. 144,156

Int. Cl.³ F26B *25/16*

U.S. Cl. 34—39 **4 Claims**



1. A method of fabricating a Yankee Dryer which has a pair of trunnions, an outer shell, heads attached to said shell and trunnions and connecting means for tying said heads together, said method comprising:

forming a roughly cylindrical weldment of steel plates butt-welded together and being of slightly smaller diameter than the desired final diameter of said outer shell;

expanding said weldment by about 0.5 to 1.0 percent of its diameter to provide roundness;

welding rings to the ends of said weldment;

stress-relieving said weldment;

re-expanding said weldment to provide a total expansion of 1.0 to 1.5 percent of its diameter and bring the weldment close to the final dimensions of said outer shell;

machining said weldment to the final dimensions of said outer shell; and

assembling said outer shell heads and connecting means.

4,320,583

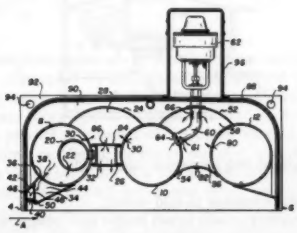
STEAM DISTRIBUTION APPARATUS FOR FLAT PAPER SHEET

Norman F. Dove, 3187 Hesigns Rd., North Vancouver, Canada (37J 3B5)

Filed Jun. 23, 1980, Ser. No. 162,585

Int. Cl.³ F26B *13/10*

U.S. Cl. 34—54 **19 Claims**



1. Apparatus to supply steam to a paper sheet moving beneath it, the apparatus having a leading edge and a trailing edge relative to sheet direction and comprising:

a first header generally adjacent the leading edge;

a second header spaced from the first;

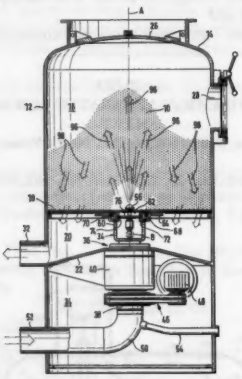
a third header spaced from the second to be generally adjacent the trailing edge;
steam supply means to the first, second and third headers;
upper and lower spaced walls extending between the first and second headers to define a first steam chamber;
first passageways through which steam may pass from the first and second headers into the first steam chamber;
second passageways through which steam may pass from the first chamber downwardly towards the sheet;
a second steam chamber extending from the first header towards the leading edge;
third passageways through which steam may pass from the first header into the second steam chamber;
a fourth passageway through which steam may pass from the second steam chamber downwardly towards the sheet to form a steam curtain at the leading edge of the apparatus to prevent air being drawn under the apparatus by the sheet;
upper and lower spaced walls extending between the second and third headers to define a third steam chamber;
a plurality of baffles formed in the third steam chamber to provide the chamber into a plurality of compartments spaced across the width of the sheet;
means to regulate the flow of steam between the second header and each compartment of the third steam chamber;
fifth passageways to enable steam to pass into the third steam chamber from the third header;
sixth steam passageways to enable steam to pass downwardly from the third steam chamber to contact the sheet passing beneath the apparatus at set predetermined parts ot the sheet.

4,320,584

FLUIDIZED BED APPARATUS

Herbert Hüttlin, Lörracher Strasse 14, 7853 Steinen, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,518
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932803
Int. Cl.³ F26B *17/10*
U.S. Cl. 34—57 A **8 Claims**



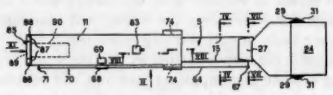
1. A fluidized bed apparatus comprising
a vessel,
a treatment chamber in said vessel,
an air chamber in said vessel below said treatment chamber,
a foraminous tray between and separating said treatment chamber from said air chamber,
a hollow rotor having means for rotating said rotor and having at least one blade located for rotation in close proximity to and below said foraminous tray, said at least one blade having a gas outlet opening upwardly,
blower means having an air pressure end and a suction end at opposite operative ends of said blower means, said air pressure end operatively connected to said gas outlet, and said suction end operatively connected to said air chamber,
said at least one blade occupying only a portion of the area beneath said foraminous tray with another portion of the area of said foraminous tray connecting said treatment chamber with said air chamber.

4,320,585

AUTOMATIC DRYING INSTALLATION

Jean Duperret, Castelnaud de Gratecambe, 47290 Cancon, France

Filed Jul. 18, 1977, Ser. No. 816,790
Claims priority, application France, Jul. 16, 1976, 76 22175
Int. Cl.³ F26B *19/00*
U.S. Cl. 34—66 **17 Claims**



1. An apparatus for drying fruits or other products continuously and automatically, comprising a cooling unit, a drying unit disposed laterally adjacent to said cooling unit, a plurality of conveyors extending horizontally and in superposed relation to one another within said drying and cooling units, means for supplying products to be dried to an upper one of said superposed conveyors, driving means coupled to said conveyors for moving said conveyors and products thereon to be dried through said cooling and drying units, means for effecting a generally horizontal flow of hot air through said drying unit from the end of said drying unit adjacent said cooling unit in a direction away from said cooling unit, said last-named means comprising an air heating unit mounted above said drying unit and separated from said drying unit by an intervening horizontal partition and duct means extending from said heating unit into the end of said drying unit adjacent said cooling unit, said driving means being operative to cause adjacent ones of said superposed conveyors to travel in opposing directions respectively and each conveyor being arranged to transfer a product being translated in one direction thereon from one end of said conveyor to a next lower one of said superposed conveyors for translation in the opposing direction, said plurality of superposed conveyors thereby being operative to move said products to be dried away from said cooling unit through said drying unit and thereafter back to said cooling unit in a succession of cycles, whereby as products being dried are conveyed through said drying unit in a direction away from said cooling unit the products pass successively through air which is increasingly less hot and less dry, and as said products thereafter move through said drying unit in a direction back toward said cooling unit the products pass through air which is increasingly hotter and drier before reaching the cooling unit to start a new cycle.

4,320,586

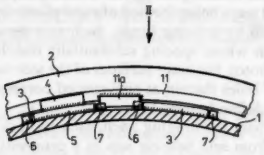
ROTARY DRUM

Reinhard Korting, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,213
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853435
Int. Cl.³ F26B *11/02, 25/02*
U.S. Cl. 34—108 **12 Claims**

1. In a rotary drum having a bearing ring loosely encircling the drum, a plurality of circumferentially spaced spacer plates loosely arranged between the drum and the bearing ring, hold-

ing means reacting between the drum and the spacer plates for limiting movement of the latter circumferentially of the drum, and retaining means for positioning each spacer plate relatively to the drum and the bearing ring, the improvement wherein said retaining means comprise a first retaining element carried



by said drum and confronting at least one end of said spacer plate for limiting movement of the latter in the direction of said one end, and a second retaining element carried by said spacer plate adjacent said one end thereof and confronting said ring for limiting movement of the latter in said direction.

4,320,587

DRYER FOR A CONTINUOUSLY TRAVELING WEB

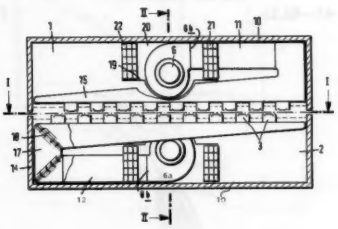
Hilmar Vits, Hüschelrath 16, D-5672 Leichlingen, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,344

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908348

Int. Cl.³ F26B *17/10*

U.S. Cl. 34—156 **7 Claims**



1. A dryer for a continuously traveling web and comprising an enclosure having an entrance and exit through which the web travels in a substantially horizontal path through the enclosure, the enclosure being formed by upper and lower open-faced interfacing chambers which are vertically separable so as to permit access to said path, each chamber having vertical side and end walls and a horizontal wall opposite to the chamber's open face, at least one of said chambers containing a substantially horizontal series of jet boxes extending along said path so as to pneumatically hold the web against deflection towards the series, a manifold positioned horizontally at the side of said series facing away from said path and manifolded to said boxes, said manifold being horizontally spaced from one side wall of the chamber and extending at least to one end wall of the chamber and having an inlet at this one end wall, a radial centrifugal blower horizontally offset from said manifold vertically opposite to and spaced from said side of said series and positioned between the manifold and said side wall, the blower having a delivery outlet positioned in a corner formed by said side wall and the horizontal wall of said one of the chambers, said outlet facing said one end wall, and a conduit interconnecting the blower's said outlet and the manifold's said inlet, said conduit changing in its extending direction from said side wall towards the middle of the chamber to as to effect said interconnecting, the other of said chambers having means for pneumatically holding the web against deflection away from said series.

4,320,588

INSOLE, IN PARTICULAR FOR LADIES' SHOES

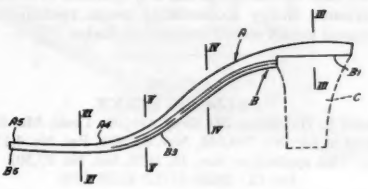
Giulio Sottolana, Via Mascheroni 15, Milan, Italy

Filed Aug. 2, 1979, Ser. No. 63,334

Claims priority, application Italy, Jul. 28, 1978, 22471 A/78

Int. Cl.³ A43B *13/28, 13/38*

U.S. Cl. 36—24.5 **10 Claims**



1. A shoe bottom comprising a molded plastic reinforcement whose upper surface houses and retains the sole of a foot including the toe area; whose lower surface retains, at the rear part thereof, the heel of a shoe; whose middle part is arched-shaped in traverse direction increasing in width and radius of curvature from rear to front, and wherein the thickness of the shoe bottom decreases to reach substantially, at the front part of the shoe bottom in the toe area, a minimum thickness and a maximum flexibility.

4,320,589

SNOWPLOW APPARATUS

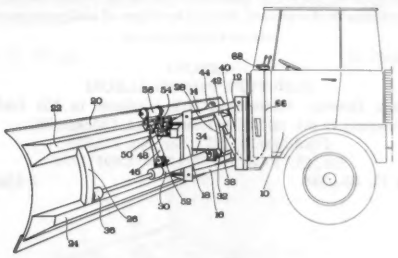
Andrea Pelazza, Strada Cuorgne 68, Mappano Caselle, Turin, Italy

Filed May 29, 1979, Ser. No. 42,865

Claims priority, application Italy, May 26, 1978, 68215 A/78

Int. Cl.³ E01H *5/06;* A01B *61/04*

U.S. Cl. 37—42 UL **3 Claims**



1. A snowplow apparatus by which a snow clearing blade is moveably connected by articulated quadrilateral means to a supporting frame mounted on the front of a vehicle, said articulated means being operative to permit vertical movement of the blade, pivotal movement of the blade about a horizontal axis extending parallel to its lower scraping edge and pivotal movement of the blade about a vertical axis disposed centrally of the blade, said pivotal movement about said vertical axis being effected by actuating means connecting said blade to a center support bar on said articulated quadrilateral means, characterized in that said snow plow apparatus further comprises

(a) a hydraulic ram connected between said blade and said supporting frame and adapted, when pressurized, to lift said blade,

(b) a first hydraulic cylinder connected between said blade

and said articulated quadrilateral means and communicating with said hydraulic ram to pressurize said ram to lift said blade when the blade pivots forwardly about said horizontal axis of rotation upon encountering resistance from an obstacle anchored to the ground and

(c) maximum pressure counteracting resilient means to prevent said blade from pivoting unless and until it encounters a resistance exceeding a predetermined value, said maximum pressure counteracting means comprising at least one second hydraulic cylinder mechanically connected to said first hydraulic cylinder so as to carry out the same movements as said first hydraulic cylinder and a pressure energy accumulating means operatively connected to said second hydraulic cylinder.

4,320,590

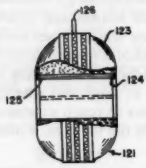
DREDGING DEVICE

Malcolm L. Holekamp, 344 Gray Ave., St. Louis, Mo. 63119

Division of Ser. No. 739,541, Nov. 8, 1976, Pat. No. 4,170,079. This application Nov. 26, 1979, Ser. No. 97,502

Int. Cl.³ B63B *21/52;* E02F *3/90*

U.S. Cl. 37—72 **3 Claims**



1. In a vessel-mounted dredging device having a suction mouth, a discharge pipe and a spoil line constituting an extension of said discharge pipe, a floatation system for said spoil line comprising a multiplicity of automotive tire carcasses strung on and spaced along said spoil line, each of said tire carcasses being filled with foamed plastic material, said tire carcasses being spread at their open inner mouths a distance at least equal to the radial distance from the outermost surface of the carcass to the surface defined by edges of said inner mouth.

4,320,591

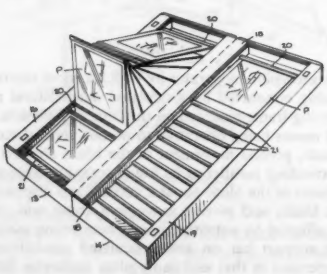
FLIP-TYPE PHOTO ALBUM

Isidore Dorman, Whitestone, N.Y., assignor to NB Jackets Company (a div. of Bell & Howell Co.), Chicago, Ill.

Filed Mar. 8, 1977, Ser. No. 775,523

Int. Cl.³ B42F *17/22, 17/34;* G09F *1/10*

U.S. Cl. 40—398 **3 Claims**



1. A flip-type photo album for storing and displaying a group of photos of like dimensions, the photos being stored in pairs in back-to-back relation, each photo being constituted by a rectangular film bearing a picture which is framed within a mat having an upper margin and a broader lower margin, said album comprising:

A. complementary interhinged front and rear covers having a tray-like configuration for accommodating the photos such that when the album is closed and the covers are superposed, the resultant structure is a box enclosing the photos and isolating the photos from atmospheric dust and dirt, said trays being formed of rigid plastic material interconnected by a living hinge, each tray having a pair of side walls whose spacing substantially matches the width of the photos, the inner surfaces of the side walls having a series of holes therein at equi-spaced corresponding positions to define bearing sets;

B. swing bars for hinging each back-to-back pair of said photos from said bearing sets in a progressively stepped row, each bar being formed from flexible material having a linear channel formation which is uniform throughout the length thereof defining a pair of inwardly-biased resilient jaws which are yieldable when the upper margins of the photo pair are inserted therebetween and which press and clamp onto said upper margin, said bars having a length greater than the width of the photos to provide projecting ends which are receivable in a bearing set by bowing the flexible bar and then releasing it to cause the bar to assume its normal linear form; and

C. coupling bars having the same construction as said swing bars but of shorter length, said coupling bars engaging the lower margins of each photo pair.

4,320,592

FISHING DEVICE

John M. Kirsch, Stevens Point, Portage County, Wis.

Filed Jun. 2, 1980, Ser. No. 155,525

Int. Cl.³ A01K *91/00*

U.S. Cl. 43—43.13 **3 Claims**

1. In a fishing device:

a generally flat rigid deflector;

at least one weight fixed on the deflector in such a fashion that the center of mass of such weight is displaced from the center of mass of such deflector;

line attachment means located on such deflector at a point on a line extending from the center of mass of said deflector to the center of mass of said weight.

4,320,593

FLYING AMUSEMENT DEVICE

Joseph E. Sarkis, 437 79 St., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 851,819, Nov. 16, 1977, Pat. No. 4,171,704. This application Nov. 20, 1978, Ser. No. 962,468

Int. Cl.³ A63H *27/00*

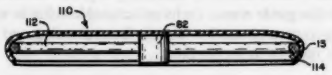
U.S. Cl. 46—74 D **7 Claims**

1. In a flying disc of the type comprising a circular central portion having substantially planar top and bottom surfaces and a sidewall integral with and depending from said central portion around the entire periphery thereof, the improvement which comprises:

an annular weighted member concentric with said disc and

secured to the internal surface of said sidewall, the weight of said annular weighted member being substantially eveny distributed about the center of said disc; and

an additional weighted member disposed at the center of said disc with its weight substantially evenly distributed thereabout, said additional weighted member depending from said bottom surface and extending no lower than the plane defined by the free edge of said sidewall, the width of said additional weighted member being substantially less than the diameter of said disc.



4,320,594

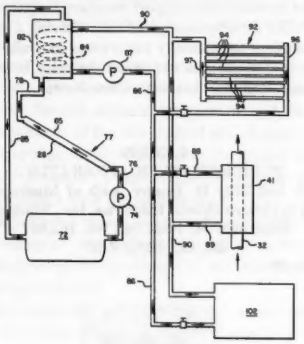
MASS ALGAL CULTURE SYSTEM

Lawrence P. Raymond, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Division of Ser. No. 974,051, Dec. 28, 1978, Pat. No. 4,253,271. This application Sep. 2, 1980, Ser. No. 183,590

Int. Cl.³ A01G *7/00*

U.S. Cl. 47—1.4 **4 Claims**



1. A process for sterilization of an algal culture container comprising:

formulating a liquid culture medium precursor from acidic nutrients;

filling an algal culture container with the acidic culture medium precursor to sterilize said container; and

adding an alkaline substance to said precursor after completing sterilization to raise the pH of the medium precursor whereby a liquid medium suitable for culture of a desired algal species is formed.

4,320,595

HERBICIDE APPLICATOR

Leon C. McClure, Rte. #2, and Stanley McClure, Sr., Rte. #2, Box 161, both of Jamestown, Ky. 42629

Filed Aug. 18, 1980, Ser. No. 177,166

Int. Cl.³ A01M *21/00*

U.S. Cl. 47—1.5 **20 Claims**

1. A liquid herbicide applicator for the selective application of herbicide to undesireable weeds, said applicator to be supported by a tractor, and which comprises in combination:

A. a centrally located supporting frame work attached to said tractor,

B. a tank associated with said frame work for holding a supply of liquid herbicide,

C. an immersion basin in operative relation with said tank for provision of a shallow liquid level of herbicide,

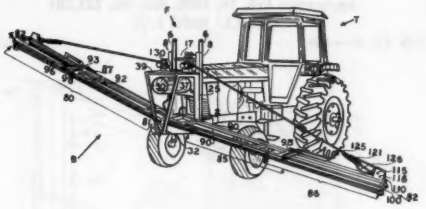
D. a boom supported by said frame work and extending laterally on each side thereof,

E. height adjustment means for adjusting the height of the boom relative to the crop to be treated,

F. a pair of distally mounted sheaves,

1. one each of said distally mounted sheaves being journalled at opposite ends of said boom,

G. a pair of medially mounted drums,



1. said pair of medially mounted drums being journalled directly over said immersion basin and extending down toward the bottom of said basin;

H. an endless rope trained over each sheave of said pair of distally mounted sheaves and over and around each drum of said pair of medially mounted drums so that said rope is immersed in said liquid and wetted with herbicide upon every revolution of said medially mounted drums,

I. means for driving at least one of said drums, so as to drive the wetted rope trained over said sheaves and in wiping engagement with the undesirable weeds.

4,320,596

PLANTER FORMED OF CONCRETE OR A SIMILAR SETTABLE MATERIAL

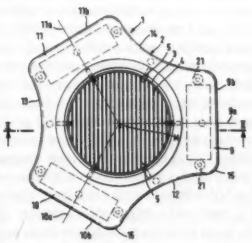
Hans Wirtz, Würselen, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 180,935

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935180

Int. Cl.³ A01G *9/02*

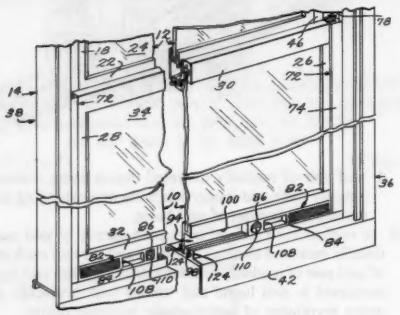
U.S. Cl. 47—66 **11 Claims**



1. A planter formed of concrete or a similar material capable of setting to form a rigid structure, comprising wall means having a laterally closed upwardly extending outer surface and an upwardly extending inner surface bounding an upwardly open hollow space having an upwardly extending axis for receiving the root structure of a plant, wherein the improvement comprises that the outer surface of said wall means includes three angularly spaced outwardly extending projections, each of said projections having an axis extending perpendicularly of the axis of said hollow space with the axis of said projections being spaced 120° apart, each of said projections

having an outer end face extending substantially perpendicularly of the axis of said projection and forming portions of said outer surface, and said outer surface between said projections comprising concavely shaped surfaces.

4,320,597
WINDOW LATCH
Maurice E. Sterner, Jr., York, Pa., assignor to Schlegel Corporation, Rochester, N.Y.
Continuation-in-part of Ser. No. 109,408, Jan. 3, 1980. This application Feb. 14, 1980, Ser. No. 121,581
Int. Cl.[3] E05C 1/10
U.S. Cl. 49—449 3 Claims



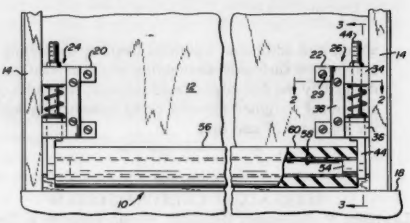
1. In a window assembly: at least two window sashes having inwardly facing surfaces and outwardly facing surfaces, said sashes being fitted into a perimeter frame formed by spaced apart longitudinal members joined at their ends to the ends of spaced apart transverse members, and means mounting at least one of the sashes for sliding movement in said frame in a longitudinal direction between a closed position and an open position and for inward movement relative to the frame; a sash retainer mounted on each longitudinal frame member for longitudinal sliding movement relative to the respective frame member, each retainer having a longitudinal dimension about equal to the longitudinal dimension of said slidable sash and being slidable between a first position coextensive with said slidable sash and a second position in which the retainer is longitudinally offset from said slidable sash, each retainer having a longitudinal fin overlying the inwardly facing surface of the respective longitudinal edge of said slidable sash when said sash and said retainer are coextensive to thereby provide support and sealing said surface; and manually releasable latches carried by said slidable sash for releasably connecting said slidable sash to said retainers and to said longitudinal frame members, each of said latches including a slidable latch member movable between an extended position in which ends of said members extend through holes in said sash retainers and into latching engagement with the respective longitudinal frame member and a retracted position in which said ends are clear of the holes in said sash retainers, and each of said latches including a manually adjustable selector element selectively operable to hold said latch members in an intermediate position in which said ends reside in said holes in said sash retainers and are clear of said longitudinal frame members.

4,320,598
DOOR DRAFT DEVICE
John J. Rodak, and Regina E. Rodak, both of 600 Pickering Rd., Southampton, Pa. 18966
Filed Mar. 24, 1980, Ser. No. 133,208
Int. Cl.[3] E06B 7/16
U.S. Cl. 49—481 7 Claims

1. A door draft device for attachment to the lower end of a swinging door comprising:

a pair of mounting brackets each having a means for enabling the brackets to be secured to a door adjacent a side edge of the door, each bracket having a guide means on an exposed surface thereof;

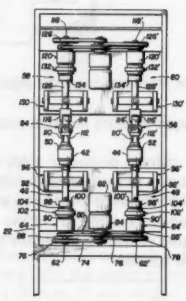
a discrete roller support assembly for each bracket, means releasably securing each assembly to its associated bracket, each assembly including a guide surface mating with the guide means on its associated bracket in a manner so as to prevent each assembly from skewing and binding with respect to its bracket;



each assembly including a support member non-rotatably mounted thereon and guided for vertical movement, a spring biasing each support member downwardly, adjustable means for limiting the downward movement of each support member, said support members rotatably supporting a roller therebetween, said roller having a deformable outer surface substantially impervious to drafts;

whereby said assemblies and said roller may be removably separated from said brackets when desired.

4,320,599
POLISHER-FINER APPARATUS
Phillip Hill, and Billy D. Hunter, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.
Filed Jun. 24, 1980, Ser. No. 162,557
Int. Cl.[3] B24B 7/00
U.S. Cl. 51—58 13 Claims



1. An apparatus for finishing a surface of a lens comprising:

a frame;

first means connected to said frame for providing an orbital, break-up motion to a lapping tool having a polishing surface of a selected base curve and cross curve, said first means including,

a first shaft having an upper end and a lower end;

means connected to the lower end of said first shaft for rotating said shaft about its axis;

means for moving the axis of said first shaft in a circular path such that the path of motion of said axis lies upon the exterior surface of an imaginary cylinder;

a second shaft having an upper end, for operable connection to the lapping tool, and a lower end;

universal ball joint means for connecting the upper end of said first shaft with the lower end of said second shaft; and

generally horizontal gimbal means mounted upon said frame for supporting said second shaft intermediate the ends thereof wherein rotation of said first shaft and movement of the axis thereof in a circular path imparts an orbital, break-up motion to the gimbal mounted lapping tool;

second means connected to said frame for providing an orbital, break-up motion to a lens of common base curve and cross curve with the lapping tool, said second means including

a first shaft having an upper end and a lower end;

means connected to the upper end of said first shaft for rotating said shaft about its axis;

means for moving the axis of said first shaft in a circular path such that the path of motion of said axis lies upon the exterior surface of an imaginary cylinder;

a second shaft having a lower end, for operable connection to the lens, and an upper end;

universal ball joint means for connecting the lower end of said first shaft with the upper end of said second shaft; and

generally horizontal gimbal means mounted upon said frame for supporting said second shaft intermediate the ends thereof wherein rotation of said first shaft and movement of the axis thereof in a circular path imparts an orbital, break-up motion to the gimbal mounted lens;

means connected to said frame for biasing the lens into engagement with the lapping tool;

first adjustment means connected to said first means for providing an orbital, break-up motion to the lapping tool for adjusting the amplitude of the orbital motion of the lapping tool; and

second adjustment means connected to said second means for providing an orbital, break-up motion to the lens, for adjusting the amplitude of the orbital, break-up motion of the lens, whereby a combination of adjustable, orbital, break-up movements are provided between the lens surface and the lapping tool surface, said second adjustment means including

a base means for connection, at one end, with the lower end of said first shaft of said second means for providing an orbital, break-up motion to the lens;

eccentric means rotatably mounted within the other end of said base means for connection, said eccentric means having a central longitudinal axis offset with respect to a central longitudinal axis of said base means;

ball means mounted at one end upon said eccentric means and at the other end within said universal ball joint means, said ball means being mounted upon said eccentric means in a position radially offset from the central longitudinal axis of said eccentric means; and

means for rotationally adjusting said eccentric means about its central longitudinal axis for selectively varying the distance said ball means is radially offset from the central longitudinal axis of said base means; and

means for locking said eccentric means in an adjusted position following rotational adjustment of said eccentric means.

4,320,600

SPRINKLING DEVICE FOR GRINDING WHEELS

Bernard Bourgoin, Saint Etienne, France, assignor to Centre Technique des Industries Mecaniques, Senlis, France

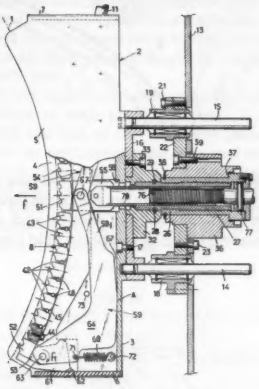
Filed Mar. 21, 1980, Ser. No. 132,612

Claims priority, application France, Jul. 19, 1979, 79 18670

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ B24B *55/02*

U.S. Cl. 51—267 **4 Claims**



1. A sprinkling device for a grinding-wheel and like equipment, of the type having an arcuate, hollow deflecting shoe connected to a source of sprinkling fluid which is capable of displacement in a direction of adjustment "f" for moving either towards or away from the grinding-wheel, the deflecting-shoe surface located opposite to the active surface of the grinding-wheel being provided with teeth or grooves oriented substantially at right angles to the direction of displacement of the active surface of the grinding-wheel in order to return the coolant or sprinkling fluid towards the grinding-wheel, and means for adjusting the curvature of the deflecting surface of the shoe according to the diameter of the grinding-wheel, comprising the deflecting surface of the shoe being formed by a series of elementary surfaces forming part of rigid blocks fixed in closely spaced relation on an arcuate strip made of elastically deformable material and capable of displacement between two cheeks of the shoe, said means for adjusting the curvature of said deflecting surface of the shoe comprising supports for the central portion and the two end portions of the elastically deformable strip, the supports provided for the two end portions of said strip each comprising an end link member attached to the corresponding end block and pivotally connected through a lever member to the support for said central portion, said end link member being capable of displacement with respect to the shoe between two cheeks of said shoe both in the direction of a component parallel to said direction of adjustment and in the direction of a component at right angles to said direction, as well as angularly about an axis at right angles to said two directions in response to suitable control means.

4,320,601

WET SANDER

John W. Haney, 2030 S. Marietta St., Gastonia, N.C. 28052

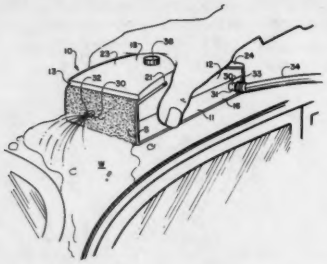
Filed Sep. 4, 1980, Ser. No. 183,885

Int. Cl.³ B24D *15/02*

U.S. Cl. 51—391 **3 Claims**

1. In combination with a sanding block having a base including a lower surface and at least two opposed walls with a strip

of sandpaper extending across the lower surface of the base and across the opposed walls and means releasably attaching the strip of sandpaper to the sanding block, a fluid conduit located in the base and terminating at one end in a sharpened



outlet projecting beyond one wall of the base and penetrating the strip of sandpaper, the other end of the fluid conduit terminating as an inlet outwardly of another wall of the base, and means connecting said inlet end of the fluid conduit to a source of fluid.

4,320,602

STABILIZING STRUCTURES AGAINST OSCILLATION

John R. Richardson, 87 Kings Rd., Kinston-upon-Thames, Surrey, England

Filed Jan. 16, 1980, Ser. No. 112,620

Claims priority, application United Kingdom, Jan. 17, 1979, 01705/79

Int. Cl.[3] E04H *12/00*

U.S. Cl. 52—1 8 Claims

1. A device for stabilizing a bluff elongated structure against transverse oscillation comprising:

a mass;

a first suspension connecting said mass to said structure whereby said mass is capable of oscillating motions in a transverse direction relative to said structure, and in which said suspension includes;

a pendulum;

a damper the line of action of which lies substantially parallel to said pendulum; and in which said pendulum and said damper are parts of a composite unit pivoted at one end to said structure and at the other end to said mass.

4,320,603

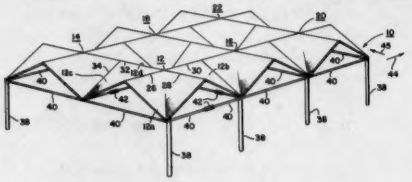
ROOF CONSTRUCTION

Solomon Kirschen, 1727 Danforth St., Philadelphia, Pa. 19152

Continuation of Ser. No. 159,935, Jun. 16, 1980, abandoned. This application Dec. 31, 1980, Ser. No. 221,526

Int. Cl.[3] E04B *7/12*

U.S. Cl. 52—18 6 Claims



1. A roof construction comprising

at least a pair of juxtaposed hyperbolic paraboloid units,

each unit comprising four quadrants,

each quadrant having a pair of spaced,

stiffened, horizontal edges and a pair of spaced, stiffened, sloping edges, the sloping edges sloping downwardly from an upper level to a lower level,

two sloping edges of the first unit being contiguous to two sloping edges of the second unit and the other sloping edges of the units being non-contiguous,

the stiffened horizontal edges all lying in a top, horizontal plane;

the juxtaposed units being joined together at respective contiguous sloping edges thereof to form a multiple unit roof span that includes both horizontally extending edges and sloping edges,

a plurality of vertical members supporting the roof span at the lower ends of only the non-contiguous sloping edges; and

first horizontally disposed and tensioned members connecting the lower ends of the sloping edges that are unsupported by vertical members with the lower ends of sloping edges that are supported by vertical members,

the first tensioned members all lying in a lower horizontal plane,

whereby a free span roof construction is provided.

4,320,604

HEAVILY INSULATED SHELTER STRUCTURE

Edward J. O'Hanlon, Warren County, Assembly Point, Lake George, N.Y. 12845

Continuation of Ser. No. 971,597, Dec. 20, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,197

Int. Cl.[3] E04B *7/04, 1/80*

U.S. Cl. 52—92 6 Claims

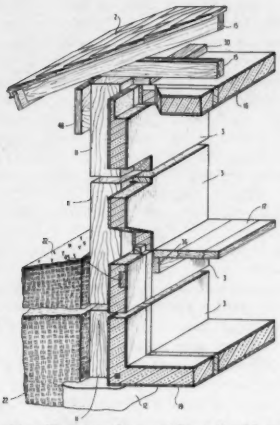
1. In a building structure of the type including a plurality of spaced post members each extending in a substantially vertical direction from an underground footing, said building structure further comprising a roof assembly including a series of trusses resting on beam members and supported on vertically upper end portions of said post members and said building structure including a floor assembly extending between said substantially vertically extending post members, wherein the improvement comprises:

insulative means for thermally insulating an interior space within said building structure to prevent transfer of heat between said interior space and a further, exterior space adjacent said building structure;

said insulative means comprising a plurality of panel-like wall members attached to one another along confronting surfaces, each of said wall members being formed of a molded polyurethane-type foam material;

said insulative means further comprising a ceiling panel assembly attached to said roof assembly and contacting

vertically upper end portions of said wall members, and a basement floor assembly contacing vertically lower end portions of said wall members, with said ceiling panel assembly and said basement floor assembly each being formed of molded polyurethane-type foam material;



wherein said ceiling panel assembly and said wall members form a continuous joint of polyurethane-type form material completely surrounding said interior space to prevent heat from leaking therethrough, and wherein said floor basement assembly and said wall members form a continuous joint completely surrounding said interior space to prevent heat from leaking therethrough.

4,320,605

INSULATION PANEL

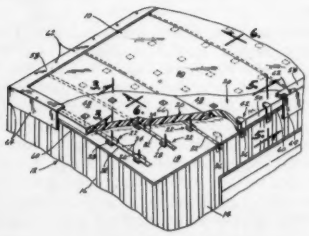
Denny L. Carlson; David C. Brissey, both of Iowa City, and Lee W. Vriezelaar, Pella, all of Iowa, assignors to Scientific Applications Incorporated, Mount Pleasant, Iowa

Filed Nov. 14, 1979, Ser. No. 94,221

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ E04D *1/28;* E04B *1/80*

U.S. Cl. 52—94 **10 Claims**



1. In combination with a building structure including opposite upstanding sidewalls, opposite upstanding end walls and a roof surface operatively connected to and extended between upper ends of said sidewalls and end walls, an auxiliary insulated roof structure comprising

a generally continuous panel structure of insulation material,

support means interposed between said panel structure and roof surface for maintaining said panel structure in clearance relation above said roof surface, and

fastening means secured to said panel structure and building sidewalls for fixing said panel structure in position on said roof surface,

said support means comprising a plurality of insulated support blocks,

each block comprising a base plate, an elongated stud secured to and extended from one side of said base plate at a generally perpendicular angle thereto, and a block of insulation material secured to the opposite side of said base plate,

said panel structure comprising a plurality of panels of insulation material, each panel including interior and exterior surfaces, opposite side edges and opposite ends,

said panels being engaged in end-to-end relation,

at least one end of each panel being rabbeted for a shiplap joint with an adjacent panel arranged in end-to-end relation therewith, and

a plurality of cover sheets, a cover sheet being secured to the exterior surface of each respective panel at a position offset toward one end of the respective panel so as to define an overlap portion extended from said one end, and

means for operatively securing the overlap portion of at least one panel to the exterior surface of the adjacent panel arranged in end-to-end shiplapped relation with said one end of said one panel, thereby to seal the seam between said overlap portion and exterior surface.

4,320,606

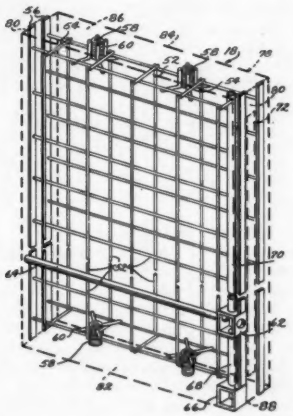
REINFORCED CONCRETE PANELS AND BUILDING CONSTRUCTED THEREWITH

Hota V. S. GangaRao, Morgantown, W. Va., assignor to Home Crafts Corporation, Clarksburg, W. Va.

Filed Dec. 6, 1979, Ser. No. 100,815

Int. Cl.³ E04C *2/04*

U.S. Cl. 52—125 **20 Claims**



1. A pre-cast reinforced concrete building panel operable to form a section of an exterior vertical wall of a building, said panel in operative position comprising:

a pair of metal reinforcing rod grids of a width generally equal to the width of the panel extending vertically generally throughout the vertical extent of said panel rigidly interconnected along their upper and lower edges in horizontally spaced relation,

a plurality of metal welding bars fixed rigidly to said grids extending vertically generally throughout the vertical extent of said panel,

a plurality of socket defining metal tubular members fixed rigidly to said grids and extending vertically in vertically aligned horizontally spaced relation along the upper and lower edges of the panel,

a block of rigid insulating material disposed between said grids generally throughout the width and vertical extent thereof,

a body of concrete hardened in contact with said grids, said bars, said tubular members, and said block of insulating material so as to provide therewith (1) an upper horizontal edge configuration from which said socket defining tubular members extend vertically downwardly, (2) a lower horizontal edge configuration, (3) an exterior vertical face defining substantially the entire exterior wall configuration of the panel, (4) an interior vertical face defining substantially the entire interior wall configuration of the panel and (5) oppositely facing vertically extending side edge configurations defining the width of said panel in which said welding bars present a plurality of substantially continuous relatively narrow vertically extending welding surfaces each of which is recessed from and faces toward an adjacent vertical face,

means defining an electrical junction box recessed within the interior vertical face of the concrete body, and

means providing electric wire access through said panel to said electrical junction box defining means.

4,320,607

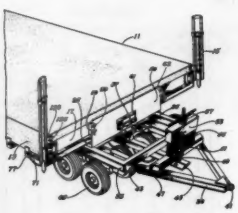
COMBINATION FLOOR, JACK AND TRAILER ASSEMBLIES

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75602

Continuation-in-part of Ser. No. 949,675, Oct. 10, 1978, and Ser. No. 932,914, Aug. 11, 1978. This application Dec. 27, 1979, Ser. No. 107,506

Int. Cl.³ E04H *1/12*

U.S. Cl. 52—143 **14 Claims**



1. In a combination that includes:

A. a jack capable of raising a floor assembly from ground level height to a predetermined height, including:

a. a superstructure that includes:

i. a base adapted to sit on ground level and at such other heights as desired to be connected to the floor assembly; the base having a passageway for downward passage of a leg means therethrough; the base slideably encompassing the leg means;

ii. a structurally strong member having a plurality of stations at a plurality of respective predetermined heights in operation for preventing movement of a lifting means upwardly along the member past a respective station when a top fastening means is emplaced at a respective station;

b. a lifting means for lifting the superstructure and a floor assembly when attached thereto; the lifting means being movable longitudinally of the member of the superstructure;

c. top fastening means for fastening the lifting means so as to prevent movement upwardly past a predetermined station on the superstructure;

d. extensible leg means for extending downwardly from the superstructure; the leg means being slideably disposed in the passageway through the base; the leg means having a plurality of stations at a plurality of respective heights therealong; the leg means having a force pad means for receiving a jacking force;

e. bottom fastening means for fastening the base so as to prevent movement of the base downwardly along the leg means past a predetermined station at which the bottom fastening means is placed; the bottom fastening means being adapted to prevent downward movement of the base past the predetermined station at which the bottom fastening means is affixed; the top and bottom fastening means being alternately operable to a plurality of different stations for jacking up the floor assembly to the predetermined height;

f. jacking means for effecting raising of the floor assembly; the jacking means being adapted to be positioned between the force pad means of the leg means and the lifting means for applying the jacking force to force the lifting means and the force pad means apart longitudinally of the superstructure;

B. a trailer assembly for carrying the floor assembly, including:

a. a front unit having a lower frame mounted on a plurality of wheels;

b. an upper frame rotatably mounted to the lower frame so as to allow the wheels and lower frame to be turned efficiently to allow the front unit to be moved laterally for movement into a close space and at least 90° in either direction with respect to straight ahead and with respect to the upper frame assembly;

c. a tongue connected to the lower frame and having a hitch means for connection to a towing vehicle;

d. a rear unit having a frame mounted on a plurality of wheels; the rear unit being capable of being moved independently of the front unit;

e. a plurality of cross members mounted to the upper frame of the front unit and the frame of the rear unit;

f. conversion means for selectively shifting the cross members between a load position in which ends of the cross members protrude beyond the edges of the wheels for supporting the floor assembly even when overwidth and a storage position in which the ends do not extend past the outer edges of the wheels for trips when empty;

g. front and rear laterally disposed flanges on the respective upper frame of the front and rear units at the respective front and rear portions thereof to move against the respective front and rear of the floor assembly; and

h. tow means for towing the rear unit with the front unit on empty trips;

the improvement comprising:

C. a prefabricated floor assembly adapted for prefabrication at a first location and transportation to a second and subsequent location comprising integrally precast:

a. a substantially planar top having length and width of predetermined dimensions and having a plurality of laterally extending beams spaced along its length;

b. at least two main longitudinally extending beams intergrally connected to said top and laterally extending beams, said two longitudinally extending beams having substantially uniform height throughout their length, located at the outside width of said top, and extending below said top and laterally extending beams so as to be set on level ground and define a space below said top and laterally extending beams without requiring additional underpinning and the like;

c. at least two end beams integrally connected to said top; said two end beams having said substantially uniform height throughout their length and located at the outside length of said top and intersecting said main longitudinally extending beams so as to define a peripheral underpinning when set on level ground and define a space between said top and said laterally extending beams and the top of the ground;

d. a plurality of longitudinally extending tensioning cables embedded in said longitudinal beam; said cables sloping downwardly in the center before said beams are cast

and cured so as to be tensioned to support the center of said floor assembly when the respective ends thereof are lifted and carried;

e. first portion of jack interconnection means for connecting said jack, said first portion of said jack interconnection means being connected with said floor assembly adjacent each corner of each of the ends of said floor assembly;

f. second portion of jack interconnection means on the superstructure of the jack for connecting said superstructure with said floor assembly; said second portion of said jack interconnection means being connected to said superstructure and having means for removeably connecting with said floor assembly;

g. first portion of trailer interconnection means for connecting with said trailer assembly, said first portion of said trailer interconnection means being connected with said floor assembly adjacent each end of said floor assembly; and

h. second portion of trailer interconnection means disposed on the trailer at the front and rear flanges for fastening to the first portion of said trailer interconnection means on the respective ends of the floor assembly, the respective front and rear being determined by the particular direction of towing;

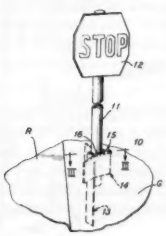
whereby said floor assembly can be raised by extension of said leg means through at least one cycle of fixing said lifting means and jacking downwardly on said leg means.

4,320,608

POST SUPPORT SOCKET

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed Dec. 17, 1979, Ser. No. 104,291
Int. Cl.³ E02D *5/74*
U.S. Cl. 52—165 **16 Claims**



1. A ground anchor for posts and the like which comprises a leg adapted to be driven in the ground having a wall adapted to receive a post thereagainst, a strip secured to the upper end of said leg cooperating therewith to form a socket receiving the post, and a wedge in said socket bottomed on said strip forcing the post against the wall of the leg in clamped relation.

4,320,609

GLAZING FASTENER FOR MOUNTING EITHER RIGID OR FLEXIBLE STORM WINDOWS

Irwin R. Abell, Portland, Oreg., assignor to Hartwig-Hartoglass, Inc., Woodstock, Ill.

Filed Feb. 22, 1979, Ser. No. 14,149
Int. Cl.³ A47H *13/00*
U.S. Cl. 52—202 **13 Claims**

1. A glazing fastener apparatus, for securing a glazing sheet across a window opening, comprising:

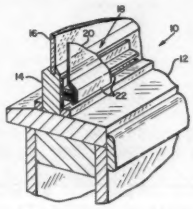
channel means defining an elongated channel having two inwardly opposed side walls connected by a channel bottom wall, at least one of said side walls including a pair of spaced-apart, generally rounded channel ribs extending lengthwise therealong;

glazing strip means for securing an edge portion of said glazing sheet to said channel means, said strip means having:

a single insert flange for insertion into said channel, said flange having opposite sides, each with a pair of generally rounded flange ribs extending lengthwise therealong in spaced-apart positions for interlocking with said channel ribs when said insert flange is inserted within said channel; and

an enternal flange means extending laterally from an outer portion of said insert flange for engaging said glazing sheet;

said channel ribs and flange ribs being spaced apart a depthwise distance at least as great as the width of said ribs;



said insert flange being sized relative to the channel to provide just enough clearance for insertion into the channel along with a flexible glazing sheet and being sufficiently rigid that, without a flexible glazing sheet in the channel, the insert flange diagonally positions in the channel to interengage one flange rib and an adjacent channel rib to secure a rigid glazing sheet under the external flange means; and

the channel means and insert flange being sufficiently resilient that the insert flange and flexible glazing can be inserted into the channel without cutting the flexible glazing between said ribs;

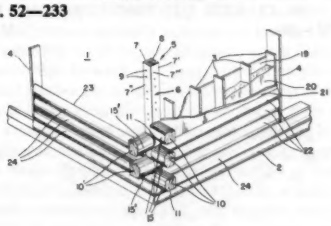
such that said glazing fastener can be used interchangeably to secure both rigid and flexible glazing sheets across a window opening.

4,320,610

SIMULATED LOG CORNER UNITS FOR ERECTING LOG CABIN TYPE STRUCTURES

Kenneth R. Rupp, Rte. 1, Florissant, Colo. 80816

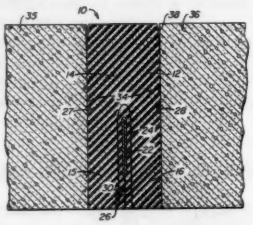
Filed Jul. 10, 1980, Ser. No. 168,430
Int. Cl.³ E04B *1/10*
U.S. Cl. 52—233 **9 Claims**



1. In a simulated log corner assembly unit for constructing log cabin type structures from preformed log siding on foundations with wall framing erected thereon, one of said units being arranged at each corner of the foundation and each comprising a vertically disposed beam, a series of relatively short simulated log end pieces attached to said beam generally at right angles thereto and relative to each other, some of said pieces projecting forwardly from said beam and some of said pieces

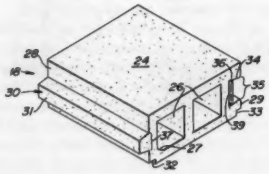
projecting laterally therefrom, said log siding being arranged in adjacent horizontal courses and extending between said corner assembly units to form the walls thereof, the ends of said siding courses abutting and attached to said beams so that said end pieces will project forwardly and laterally therefrom in relationship to said siding courses and whereby said end pieces will simulate the intersecting corner ends of said siding courses and simulate the finished look of a structure constructed from regular logs.

4,320,611
FIRE RETARDANT SEAL
Albert J. Freeman, 2051 43rd Ave., San Francisco, Calif. 94116
Filed Feb. 4, 1980, Ser. No. 118,351
Int. Cl.³ E04B *1/62*
U.S. Cl. 52—309.1 **9 Claims**



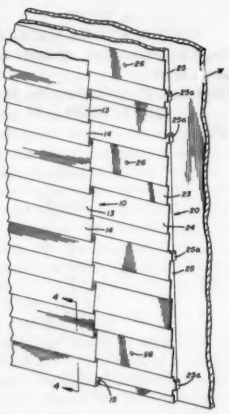
1. A device for providing a fire resistant seal in a gap between two structural members, said device comprising a preformed elongate strip of resilient silicone foam material having a generally Y-shaped cross section, each of the legs of the Y-shaped cross section having a width equal to one-half that of the base, and the portion of the strip where the legs meet the base of the Y having a width in excess of that of the base alone so that upon insertion of the strip into the gap, the legs of the Y-shaped strip are pressed together, the strip assumes the rectangular cross-section of the gap, and the portion of the strip where the legs meet the base is compressed and thereby provides a tight seal between the strip and the surfaces of the gap wherein air pockets other than those inherent in the cellular structure of the foam material are absent throughout the length and breadth of the seal.

4,320,612
END BLOCK
Ernest H. Jeffries, Jr., Greensboro, N.C., assignor to Resco Products, Inc., Norristown, Pa.
Division of Ser. No. 15,038, Feb. 26, 1979, Pat. No. 4,243,385.
This application Aug. 15, 1980, Ser. No. 178,249
Int. Cl.³ E27D *3/12*; E04C *1/10, 1/30*
U.S. Cl. 52—396 **11 Claims**



1. An end block designed for use on a kiln car comprising a refractory body having top and bottom horizontally disposed major faces and two vertically disposed end faces, a transverse projection extending from one end face thereof generally parallel to said major faces and a transverse recess extending into an opposite end face thereof, said recess having means for retaining a layer of resilient refractory material therein without the use of fastening means for contact with a corresponding projection of another block, said retaining means comprising the shape of said recess such that the innermost surface of said recess has a vertical dimension greater than the vertical dimension of any other portion of said recess and whereby the smallest vertical dimension of said recess is greater than the largest vertical dimension of said projection so that said corresponding projection of another block can enter said recess with a loose fit, and said projection having a cross-sectional shape different from the cross-sectional shape of said recess.

4,320,613
PROFILED INSULATING UNDERBOARD
Donald L. Kaufman, Akron, Ohio, assignor to Alside, Inc., Akron, Ohio
Filed May 17, 1979, Ser. No. 39,796
Int. Cl.³ E04D *3/361, 1/80*
U.S. Cl. 52—521 **7 Claims**



1. In combination with a building presenting an external support surface, a wall covering system for the building, comprising:

(A) at least one sheet of insulating material having
(1) a generally rectangular planar configuration,
(2) a substantially flat rear surface, and
(3) a profiled outer surface;

(B) a plurality of siding panels each having a connecting flange and a nailing strip on its top edge and a return element on its bottom edge;

(C) said profiled outer surface of said sheet of insulating material being contoured complementally with the inner surfaces of said siding panels;

(D) attachment means passing through said siding panels and said insulating material and engaging said support surface to secure said siding panels and said insulating material to said support surface; and

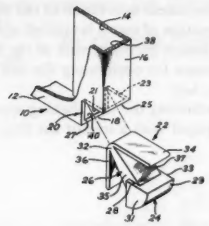
(E) said sheet of insulating material having a series of laterally extending, integral projections on one longitudinal edge surface.

4,320,614

PANEL ASSEMBLY FOR SHEET METAL PANELS HAVING DOUBLE WALL CONSTRUCTION CORNERS

Bernard J. Brezosky, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 7, 1980, Ser. No. 110,057
Int. Cl.³ E04C 2/32
U.S. Cl. 52—630 6 Claims



1. A panel assembly comprising:

a panel having an outer wall, a substantially parallel inner wall and side walls along at least two adjacent edges of said panel, substantially spanning the space between said outer and inner walls; said panel having a portion removed at the point of intersection of said adjacent edges, the resultant exposed edges defining a cut-away corner; and

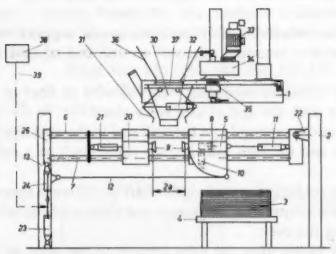
a corner plug having an exterior body portion formed to substantially fill said cut-away corner and to provide a smooth transition surface between said adjacent side walls across said cut-away corner; and an interior portion comprising a shank portion projecting from said body portion through said cut-away corner into the interior region bounded by said inner, outer and side walls, and a pair of resilient ears projecting from opposite sides of said shank portion, the free end of each ear abuttingly engaging the interior face of the adjacent side wall, thereby limiting outward movement of said corner plug.

4,320,615

APPARATUS FOR THE AUTOMATIC FILLING OF BAGS AT THE DISCHARGE SPOUT OF A FILLING HOPPER

Bruno Gmür, St. Gall, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,133
Claims priority, application Switzerland, Mar. 14, 1979, 2409/79
Int. Cl.³ B65B 43/18, 43/54
U.S. Cl. 53—67 19 Claims



1. An apparatus for the automatic filling of bags at a discharge spout of a filling hopper wherein a plurality of empty bags are stored in a bag magazine in a horizontal position, said apparatus comprising:

an attachment unit hub;

a frame pivotably mounted on said hub;

a suction device mounted on said frame for individually removing each bag from said bag magazine and for swinging the removed bag into an essentially vertical hanging position and including a drum having suction means;

a spreading mechanism mounted on said frame for opening the bag mouth of each of said removed bags; and

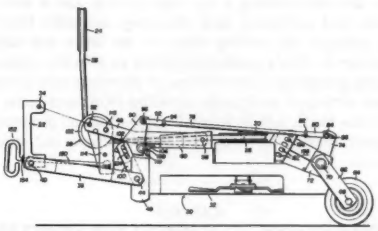
a holding device for holding each bag mouth tightly against said discharge spout, wherein said drum is mounted on said frame for horizontal movement, for rotation about an axis parallel to the surface of said stored bags and for movement parallel to the longitudinal axis of said stored bags upon pivoting of said frame about said attachment unit hub, such that said drum is lowered towards said stored bags so that said suction means causes removal of the respective topmost stored bag near each said bag mouth.

4,320,616

LAWN MOWER SUSPENSION

John H. Marto, Oshkosh, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 18, 1980, Ser. No. 217,617
Int. Cl.³ A01D 35/26, 55/29
U.S. Cl. 56—15.3 10 Claims



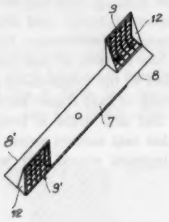
1. A suspension for a lawn mower assembly beneath a tractor, said mower assembly having an endless flexible drive belt received about pulleys on the tractor and lawn mower, and a belt tensioning means including a pair of idler sheaves which receive the drive belt and maintain tension in said belt, said mower assembly suspension comprising, in combination: a pair of spaced parallel lower links pivotally attached at their forward ends to said tractor adjacent the forward end of said tractor, said lower links pivotally attached at their rearward ends to said mower assembly adjacent the forward end of said mower assembly, a pair of parallel spaced upper links pivotally attached at their forward ends to said tractor on pivots spaced above and rearwardly of the pivotal connections of said lower links, said upper links pivotally connected at their rearward ends to a midportion of said mower, said upper and lower links being generally parallel, said idler sheaves supported on a bracket means on said upper links rearwardly of said pivotal connections of said upper links to said tractor, wheels rotatably connected to wheel support arms, said support arms pivotally connected to said mower adjacent the rearward end of said mower and supporting the rear end of said mower assembly, and lift linkage means operably interconnecting said wheel support arms and said upper and lower links, said lift linkage means adapted to simultaneously raise or lower the rearward ends of said upper and lower links in parallel relation upon rotation of said wheel arms to raise said mower rear end, thereby raising and lowering said mower ends in parallel relation while maintaining the tension in said drive belt.

4,320,617

STRUCTURE BLADE EFFECTIVE TO BE APPLIED TO ROTATING GRASS-CUTTING MACHINES

Luisa Fedeli, Via dei Gracchi, 26, 20100 - Milano, Italy

Filed Jan. 4, 1980, Ser. No. 109,660
Claims priority, application Italy, Jan. 15, 1979, 19286 A/79
Int. Cl.[3] A01D *55/18*
U.S. Cl. 56—295 1 Claim



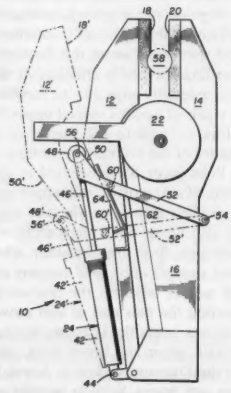
1. In a motor driven rotary blade-type grass cutting machine comprising a wheeled casing, a single cutting blade mounted in the casing and rotating about an axis perpendicular to the plane in which said machine moves, said blade being sharpened along two opposite edges for engagement of the grass during rotation, and evacuating duct in said housing for the ejection of the pieces of cut grass and a container for collecting said cut grass ejected through said duct, the improvement which comprises a perforated vertical wall at the rear of each end of the blade, said wall having a top edge portion and a side edge portion, said perforated wall extending upwardly from said blade adjacent the trailing edges of the blade and defining respective air flow passages to present an effective grass capture area greater than the effective air resistance area presented by said perforated wall in the direction of air movement relative to the blade, said perforated wall aiding and directing the cut grass through said duct into said container and reducing the noise.

4,320,618

TREE SHAKER ATTACHMENT FOR VEHICLES

John E. Dandl, P.O. Box 687, Chico, Calif. 95926

Filed Mar. 19, 1981, Ser. No. 245,383
Int. Cl.[3] A01D *46/26*
U.S. Cl. 56—328 TS 13 Claims



1. Tree shaking apparatus for mounting on a vehicle or the like, comprising

a pair of jaws,

a first elongated ramp means formed on one jaw,

an actuating cam means arranged for engagement with the first ramp means,

motor means interconnected with the cam means for linearly moving the actuating cam means generally parallel with the first elongated ramp means,

a link pivotably interconnected between the actuating cam means and a relatively fixed member of the tree shaking apparatus whereby linear movement of the actuating cam means in one direction of travel is applied against the first elongated ramp means by interaction of the link with the actuating cam means for positioning the one jaw relative to the other jaw, and

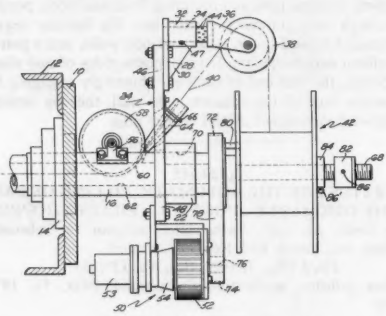
shaker means for vibrating the tree shaking apparatus when the jaws are engaged with a tree or the like.

4,320,619

PAYOFF NEUTRALIZER FOR CABLING WIRE AND FIBER STRANDS

Joseph R. Allard, Warwick, R.I., assignor to The Entwistle Company, Hudson, Mass.

Filed Apr. 7, 1980, Ser. No. 137,978
Int. Cl.[3] D01H *13/10*; D07B *3/04*
U.S. Cl. 57—59 12 Claims



1. A payoff neutralizer that is designed for use in a wire or fiber cabling machine comprising in combination:

a support means;

a hollow rotor shaft rotatably mounted in said support means;

a flyer rotatably mounted adjacent to one end of said rotor shaft;

a means for rotatably mounting a reel of wire or fiber in axial alignment with the end of said rotor shaft;

the wire strand traveling from the said reel to the said flyer and then into and through said hollow rotor shaft to a cabling machine;

a means for rotating the said rotor shaft at different speeds;

a means for controlling the speed and tension of the wire or fiber leaving the reel;

a means for monitoring the wire tension of the wire or fiber prior to cabling;

means for monitoring the speed of the wire or fiber prior to cabling;

means for correlating the speed and tension of the wire or fiber leaving the said reel.

4,320,620
ARRANGEMENT FOR FASTENING A STRUCTURAL PART TO A ROUND STEEL CHAIN

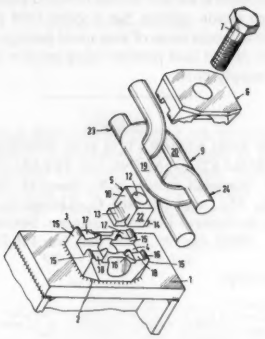
Werner Rieger; Horst Elsässer, both of Aalen-Unterkochen; Hartwig Zenker, Lauchheim; Alfred Bittlingmaier, Aalen-Ebnat, and Hans H. Dalferth, Aalen-Wasseralfingen, all of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,049

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924721

Int. Cl.³ F16G *15/00*

U.S. Cl. 59—93 **5 Claims**



1. In an arrangement for fastening a structural part, especially a scraper, to a round steel chain in which two webs having, viewed in the longitudinal direction of the chain link, two clamping jaw pairs arranged behind one another are clamped across the two long sides of a chain link by a clamping screw which penetrates through the link and through a centering member with parallel side faces whose ends form stops for the short sides of two adjacent chain links connected to the chain link bridged by the webs and whose side faces have a spacing from one another which is approximately equal to the inside width b_i of the chain link passed through by the clamping screw,

the improvement comprising:

at least one (3) of the webs (3,6) is provided with a guide (4) which is formed by a recess on the side of the web (3) facing the chain link (9) bridged by the webs (3,6), and that the centering member (5) is provided with projections (13,14) engaging into said recess (4).

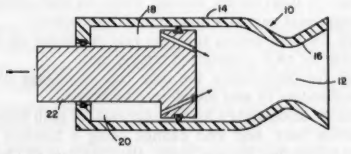
4,320,621
PREVENTION OF AMMONIA FORMATION IN ROCKET MOTORS AND LASER PUMPING SYSTEMS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1980, Ser. No. 116,114

Int. Cl.³ C06D *5/00*; H01S *3/00*

U.S. Cl. 60—214 **5 Claims**



1. A method for the prevention of the formation of ammonia as a byproduct in the reaction of hydrazine and a halogen oxidizer when used in liquid-propelled rocket engine system or in a chemical laser pumping system, said method comprising the steps of:

(i) providing a predetermined quantity of a halogen oxidizer selected from the halogen oxidizers consisting of chlorine trifluoride and chlorine pentafluoride to be reacted with hydrazine;

(ii) incorporating an effective amount of vanadium pentafluoride into said halogen oxidizer, said effective amount of said vanadium pentafluoride being about 1% by weight of said predetermined quantity of said halogen oxidizer, and said effective amount being adequate to shift the equilibrium of the reaction between said hydrazine and said halogen oxidizer so that no ammonia is produced; and

(iii) reacting said halogen oxidizer containing said vanadium pentafluoride with hydrazine to yield reaction products free from ammonia.

4,320,622
PUMP UNLOADER AND ACCUMULATOR CHARGING VALVE

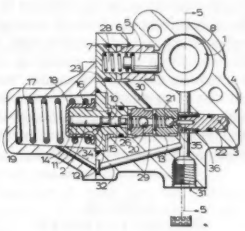
Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 2, 1979, Ser. No. 63,085

Claims priority, application United Kingdom, Aug. 17, 1978, 33637/78

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—418 **8 Claims**

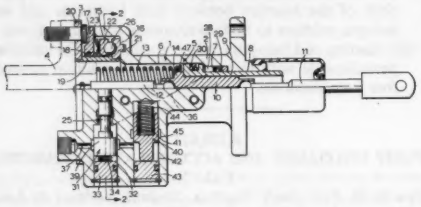


1. An hydraulic system comprising a tank for hydraulic fluid, an hydraulic accumulator, a pump for drawing fluid from said tank to charge said accumulator, and an unloader valve comprising a body having a first port connected to said pump, a second port connected to said accumulator and a third port connected to said tank, a control valve member in said body having a region of constant area subjected to the pressure at said first or second ports, a suction valve in said body biased at all times towards its closed position for controlling a connection in said body between said first and third ports, a pressure responsive slave member in said body for operating against said suction valve to retain same open to unoad said pump, first fluid passage means extending between said control valve member and said slave member, second fluid passage means extending between said control valve member and atmosphere, said control valve member being movable between a first position in which said first fluid passage means is disconnected from said second port and connected to said second fluid passage means and a second position in which said first fluid passage means is disconnected from said second fluid passage means and connected with said second port, and a single spring biassing said control valve member towards its first position but yielding at a first predetermined pressure at said first or second ports to move from said first to said second position, said bias in said single spring being selected that said control valve member responds to a second predetermined pressure at said second port less than the first to move from its second to its first position.

4,320,623
FLUID-PRESSURE OPERATED BOOSTERS FOR VEHICLE BRAKING SYSTEMS

Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 5,786, Jan. 23, 1979, abandoned, which is a continuation of Ser. No. 799,263, May 23, 1977, abandoned.
This application Sep. 4, 1980, Ser. No. 184,140
Claims priority, application United Kingdom, May 21, 1976, 20988/76
Int. Cl.³ B60T 13/00
U.S. Cl. 60—547 R 10 Claims

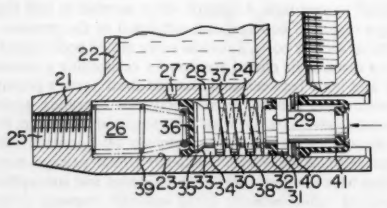


1. A servo-motor assembly for a vehicle braking system comprising a housing having a bore, a pedal-operated input member and a movable wall working in said bore, an output member upon which said movable wall acts, said input and output members being co-axial, and both being axially movable in said bore, means defining a boost chamber in said bore, and valve means for controlling the flow of pressurized fluid into said boost chamber to act on said movable wall, a valve operating mechanism comprising a valve actuating member, means mounting said actuating member for angular movement about the longitudinal axis of said bore, and means for moving said actuating member angularly to operate said valve means in response to axial movement of said input member in a brake applying direction with respect to said bore.

4,320,624
MASTER CYLINDER

Hiroo Takeuchi, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Mar. 24, 1980, Ser. No. 133,399
Claims priority, application Japan, Mar. 28, 1979, 54/36667
Int. Cl.³ B60T 11/26
U.S. Cl. 60—588 3 Claims

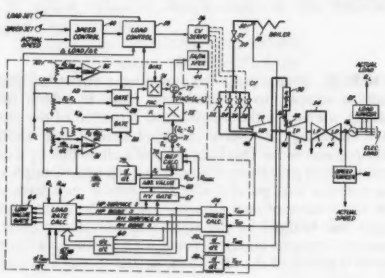


1. A master cylinder comprising a cylinder body having a cylinder bore defined therein, said cylinder bore being in communication with an oil tank through a supply port and a relief port which are formed through the wall of said cylinder bore in axially spaced apart relation from each other, a piston slidably received in said cylinder bore to define a hydraulic chamber forwardly thereof, said piston having a pair of forward and rear piston portions axially spaced from each other with an annular seal member disposed therebetween, and a cup support integrally formed with said forward piston portion forwardly thereof and having a radially outer peripheral surface facing the inner peripheral surface of said cylinder bore with an annular clearance formed therebetween, an annular passage defined between said cup support and said forward piston portion, a communication passage means formed in the outer peripheral surface of said forward piston portion and communicating with said annular passage and said supply port, and a resilient piston cup directly carried on the forward face of said cup support for controlling communication between said relief port and said hydraulic chamber in accordance with the axial sliding movement of said piston in said cylinder bore, the improvement wherein: said forward piston portion has an axial width larger than the diameter of said supply port; said communication passage means comprises a spiral passage formed in the outer peripheral surface of said forward piston portion; and said forward piston portion has a spiral land portion formed between the adjacent turns of said spiral passage, and the width of each turn of said land portion being smaller than the diameter of said supply port.

4,320,625
METHOD AND APPARATUS FOR THERMAL STRESS CONTROLLED LOADING OF STEAM TURBINES

Bernd A. K. Westphal, Scotia, N.Y.; James H. Moore, Jr., Cape Elizabeth, Me., and Richard G. Livingston, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1980, Ser. No. 145,219
Int. Cl.³ F01K 13/02
U.S. Cl. 60—646 13 Claims



1. In a control system for a steam turbine having a high pressure section, at least one lower pressure reheat section, a high pressure rotor, a reheat rotor, and a plurality of valves operable to admit steam to the high pressure section through nozzle arcs, a combination to control thermal stress on component parts of the turbine while simultaneously providing maximum loading and unloading rates during all phases of turbine operation, said combination comprising:

load control means for positioning said valves to admit a desired total steam flow to said turbine;

admission mode transfer means for adjusting the relative openings of said valves;

means for determining the temperature of preselected high pressure section component parts and for preselected reheat section component parts;

means for determining steam temperature at preselected locations;

means for determining thermal stress on each preselected component part as a function of temperature;

means for determining the time rate of change of thermal stress for each preselected turbine part;

means for determining the time rate of change of steam temperature of said preselected locations;

means for calculating a load change rate for each preselected turbine part, said load change being a function of the corresponding thermal stress, the time rate of change of said stress, and the corresponding rate of change of steam temperature;

means for selecting the lowest calculated load change rate and for applying said lowest rate to said load control means to change the turbine load accordingly;

means for calculating a reference value of stress as a function of a preselected initial loading rate; and

means for determining the difference between said reference value of stress and thermal stress determined for a preselected high pressure section component part, said difference being applied to said admission mode transfer means to cause said valves to be adjusted to relative openings which minimize said difference.

4,320,626

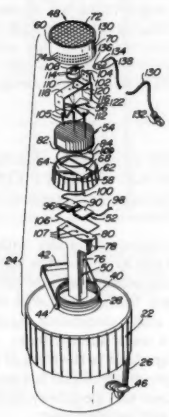
PORTABLE BEVERAGE CHILLER/WARMER

Joseph H. Donnelly, Warrington, Pa., assignor to Fogel Commercial Refrigerator Company, Philadelphia, Pa.

Filed May 12, 1980, Ser. No. 149,212

Int. Cl.³ F25B *21/02*; B67D *5/62*

U.S. Cl. 62—3 **6 Claims**



1. A portable container for cooling or heating a liquid stored therein, comprising a hollow body and a releasable securable lid assembly therefor, said body being hollow and defining a liquid-receiving chamber therein and including a threaded mouth to said chamber, said lid assembly including threads for releasable engagement with the threads of said mouth to seal said chamber, first relatively narrow, elongated, thermally conductive immersion means, said immersion means occupying a small portion of the liquid-receiving chamber and being mounted on said lid and extending downward therefrom for substantially the full depth of said chamber for immersion in any liquid held therein, thermoelectric means of the Peltier type and second thermally conductive means, said thermoelectric means having a pair of thermal surfaces, one of said surfaces in intimate thermal engagement with said first thermally conductive immersion means and the other of said surfaces in intimate thermal engagement with said second thermally conductive means, and electrical connecting means for connecting said thermoelectric means to direct current in a manner such that the polarity applied to said thermoelectric means can be selectively reversed so that said surfaces can be made either hot or cold as desired.

4,320,627

APPARATUS FOR RECOVERING NATURAL GAS IN A MINE

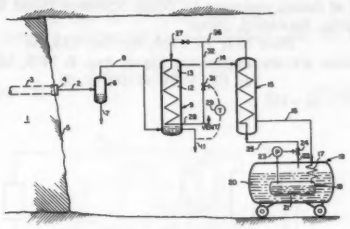
Leonard J. Hvizdos, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 88,898, Oct. 20, 1979, Pat. No. 4,271,676.

This application Jan. 19, 1981, Ser. No. 225,955

Int. Cl.³ F17C *13/00*

U.S. Cl. 62—54 **2 Claims**



1. A transportable apparatus for liquefying a hydrocarbon gas in a mine comprising:

(a) a portable insulated first vessel having a wall capable of holding and storing cryogenic liquid,

(b) a second vessel within said first vessel, said second vessel capable of holding liquefied hydrocarbon gas,

(c) a first conduit from said second vessel through said wall of said first vessel, said conduit being in heat exchange relationship with the volume within said first vessel, and

(d) a second conduit through said wall of said first vessel.

4,320,628

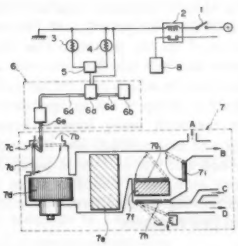
QUICK AIR COOLING SYSTEM FOR USE WITH AUTOMOTIVE VEHICLE AIR CONDITIONER

Masao Okajima, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 6, 1980, Ser. No. 194,312

Int. Cl.³ F25D *17/04*; F25B *25/00*

U.S. Cl. 62—186 **3 Claims**



1. A system for use with an automotive vehicle air conditioner having a first air intake port opening into the vehicle interior and a second air intake port opening to the vehicle exterior and an air intake valve for selectively alternatively closing said air intake ports, said system comprising:

(a) first sensor for sensing the air temperature within the vehicle interior;

(b) second sensor for sensing the air temperature outside the vehicle;

(c) comparator for comparing the two sensed temperatures; and

(d) valve actuator for shifting the valve to alternatively close said air intake ports,

said comparator being constructed to send an output signal

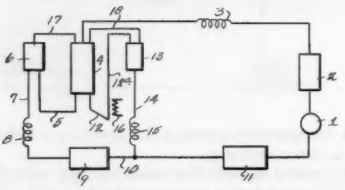
to said valve actuator indicating which of the vehicle interior air and the vehicle exterior air is a lower temperature than the other, and said valve actuator actuates the air intake valve to open the air intake port opening to the lower temperature one.

4,320,629

REFRIGERATING APPARATUS

Noboru Nakagawa, Osaka; Toshiyuki Oonishi, Takatsuki; Masato Tsutsumi, Osaka, and Akira Kawamoto, Takatsuki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1980, Ser. No. 153,134
Claims priority, application Japan, Aug. 8, 1979, 54/101090
Int. Cl.³ F25B *41/00, 41/06*
U.S. Cl. 62—198 **1 Claim**



1. Refrigerating apparatus comprising:
a compressor for compressing a refrigerant,
a tank for storing said refrigerant,
at least two evaporators serially connected and controlled to a different temperature by evaporation of said refrigerant, one of said evaporators being a freezer evaporator and the other a refrigerator evaporator,
first and second liquid reservoirs respectively connected between said tank and each evaporator,
a plurality of conduits for flowing said refrigerant to said compressor, said evaporators, said reservoirs and said tank,
a vapor bubble pump for pumping said refrigerant from said tank and for controlling the flow of said refrigerant to the junction of said evaporators and then through said freezer evaporator, and
first and a second pressure regulators for regulating the pressure of said refrigerant, said first pressure regulator being located on the upstream side of said refrigerator evaporator between said first reservoir and said refrigerator evaporator in which said refrigerant flows when said vapor bubble pump is not in operation and said second pressure regulator being located between said second reservoir and said junction and in which said refrigerant flows when said vapor bubble pump in operation, said regulators each being capillary tubes with said second regulator having a greater resistance to refrigerant flow than said first regulator.

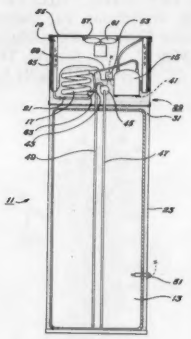
4,320,630

HEAT PUMP WATER HEATER

Robert B. Uselton, and Joseph A. Pietsch, both of Dallas, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 6, 1980, Ser. No. 204,497
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **4 Claims**

1. In a heat pump water heater adapted for use in a building such as a house and the like, and including
a. a compressor;
b. a condenser;
c. an evaporator; and
d. an expansion device; connected in a closed circuit containing a refrigerant adapted to circulate hot refrigerant gas in heat exchange relationship with water for heating said water; and
e. a hot water storage tank and water circuit connected and adapted for circulation of said water in heat exchange relationship with said hot refrigerant; the improvement comprising:
f. a thermoplastic, molded base disposed on top of said hot water storage tank; said molded base having disposed interiorly and adjacent it periphery an evaporator receiving depression that has a drain for draining off condensed liquid;
g. respective mounts for said compressor;
h. having said condenser in the form of a coil disposed atop said hot water storage tank on said base and having a refrigerant path and a water path for transferring heat from hot, compressed, refrigerant gas to said water, simultaneously condensing said refrigerant to a liquid refrigerant;
i. water circulating means for circulating said water through said water path of said condenser;



j. water circuit connected serially with said water path in said condenser and having suction side of said water circulating means communicating interiorly of said hot water storage tank and having discharge line from said water path and said water circulating means connected interiorly of said hot water storage tank;
k. having said evaporator in the form of a heat exchange coil disposed upright on top of said hot water storage tank and disposed adjacent said periphery and in said depression, with drain, of said molded base;
l. a top defining an air circulation path for flowing ambient air in heat exchange relationship with said evaporator for vaporizing said liquid refrigerant within;
m. air circulation means for circulating said ambient air in heat exchange relationship with said evaporator, simultaneously evaporating said refrigerant and cooling said air; and
n. means for circulating the cooled air into the interior of said building for cooling said building simultaneously with heating said water.

4,320,631

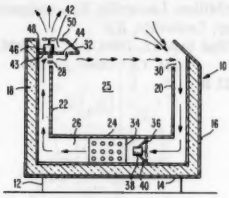
AIR DEFROST FOR LOW-BED REFRIGERATED DISPLAY CASES, UTILIZING SILL-MOUNTED AUXILIARY FAN

John H. Vana, Allentown, N.J., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 23, 1981, Ser. No. 227,846
Int. Cl.³ A47F *3/04;* F25D *21/10*
U.S. Cl. 62—256 **12 Claims**

1. In a low-bed refrigerated display case having rear, bottom, and front walls providing a product well at the top of which an access opening is defined, the walls further providing

an air passage that extends about the product well and a discharge grill and a return opening extending along the rear and front edges, respectively, of the access opening, an evaporator coil in the passage, and a circulating fan also mounted in the passage to circulate air through the passage and coil and form an air curtain in movement across access opening from the discharge grill to the return opening during the refrigeration mode of the case, the improvement comprising a discharge sill mounted on the rear wall above the outlet, the sill having a defrost air chamber to which entry is had through inlet ports



located adjacent the discharge grille, and from which air may be discharged through outlet ports to the ambient atmosphere surrounding the case; and defrost air fan means mounted in the chamber and adapted for operation during a defrost mode in a direction to draw air into the chamber through the inlet ports and discharge it through the outlet ports, in a quantity such that at least part of the air exiting the discharge grille is discharged through the sill to the surrounding ambient and thereby diminishes the air curtain voluntarily to an extent effective to induce at least some ambient air to enter the return opening.

4,320,632

SLIDING UNIVERSAL JOINTS NOTABLY FOR AUTOMOBILE VEHICLE TRANSMISSIONS

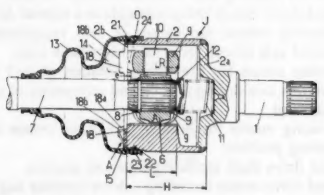
Jacques P. Dore', Colombes, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Oct. 15, 1979, Ser. No. 84,598

Claims priority, application France, Oct. 27, 1978, 78 30648

Int. Cl.³ F16D *3/30*

U.S. Cl. 64—21 **4 Claims**



1. A sliding universal joint for an automobile transmission comprising a substantially bowl-shaped drive element connected to a drive shaft and having at least two ball races cooperating with rollers borne by a hub connected to a driven shaft, stop means at the open end of the drive element for retaining the rollers and the end of the driven shaft inside the drive element, said stop means being arranged so that when a roller is supported against the stop means, a part of this roller is outside the drive element while the center of the roller thus retained is near the open end of this element, the axial length of the drive element being selected so that said ball races have sufficient length to permit useful travel of the rollers; said stop means comprising a cup having a central opening for the passage of the driven shaft bordered by indentations for becoming extensions of the ball races, these indentations being bounded, in the circumferential direction, by tongues projecting outwards in the longitudinal direction with respect to the open end of the drive element, these tongues having a concave inner surface, the edges of the tongues furthest from the drive element defining an opening whose size is sufficiently small to retain a roller.

4,320,633

FREEWHEEL COUPLING

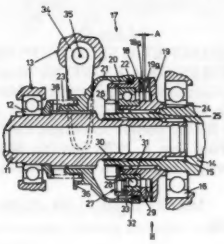
Geoffrey J. Humphrey, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Dec. 18, 1979, Ser. No. 104,977

Claims priority, application United Kingdom, Jan. 10, 1979, 00931/79

Int. Cl.³ F16D *3/00*

U.S. Cl. 64—25 **17 Claims**



1. A freewheel coupling including drive means adapted to drivingly connect co-axial driving and driven shafts so as to transmit rotation in one direction of rotation and to overrun when the speed of rotation of the driven shaft exceeds that of the driving shaft, and preventer means adapted to prevent engagement of the drive means except when the speed of rotation of said driving and driven shafts is substantially synchronized wherein said preventer means includes a ball bearing having inner and outer races, a ball race comprising a plurality of balls retained in equi-spaced relationship and arranged to run in circumferential trackways formed in facing surfaces of said inner and outer races, and a plurality of equi-spaced slots equal in number to the number of balls and extending laterally from an open end opening into one of said trackways to permit relative axial movement of the inner and outer races by movement of the balls in said slots.

4,320,634

THERMAL-FUSIBLE TAPE OF A WARP KNITTED FABRIC

Koichi Hashimoto, Ibaraki, and Takamasa Nishimura, Shiga, both of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

PCT No. PCT/JP79/00072, § 371 Date Nov. 24, 1979, § 102(e) Date Nov. 20, 1979, PCT Pub. No. WO79/00832, PCT Pub. Date Oct. 18, 1979

PCT Filed Mar. 23, 1979, Ser. No. 170,677

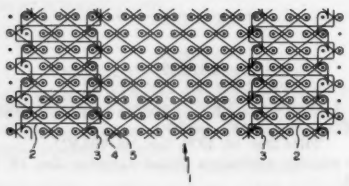
Claims priority, application Japan, Mar. 24, 1978, 53-32984; Mar. 24, 1978, 53-32985

Int. Cl.³ D04B *7/16, 1/14*

U.S. Cl. 66—202 **13 Claims**

1. In a thermo-fusible tape of a warp knitted fabric, the entire tape having proper elasticity and flexibility and a balanced and flat construction over the whole width of the tape, the improvement which comprises in that at least one thermal adhesive thread extends longitudinally within a width of several wales of the warp knitted fabric in each edge portion of said tape, said thermal adhesive thread being partially held by at

least one of the threads forming the ground of said knitted fabric, and portions of said thermal adhesive thread, which



extend between two held portions, float on one or both surfaces of said warp knitted fabric.

4,320,635

ELECTROMAGNETIC SELECTION DEVICE FOR NEEDLES OF A KNITTING MACHINE

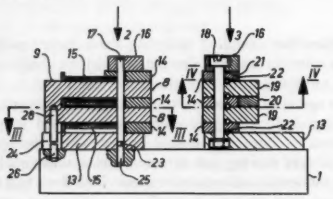
Claude Cuche, Corcelles; Rene Jeanneret, Motiers, and Michel Niederhauser, Fleurier, all of Switzerland, assignors to Edouard Dubied & Cie. Societe Anonyme, Couvet, Switzerland

Filed Jun. 4, 1979, Ser. No. 44,997

Claims priority, application Switzerland, Jun. 5, 1978, 6115/78

Int. Cl.³ D04B *15/78, 15/70*

U.S. Cl. 66—220 **5 Claims**



1. An electromagnetic selection device for needles of a knitting machine, comprising selector means relatively movable in a selection canal in a longitudinal direction thereof and shiftable in said canal in a transverse direction thereof, said selection canal having two outer portions forming, in said longitudinal direction of said canal, a narrowing entry and a widening outlet, respectively, for said selector means, and an inner portion comprising electromagnetic selection means for shifting said selector means transversely of said longitudinal direction toward one or the other side of said selection canal during relative movement of said selector means through said selection canal, said selection device comprising two substantially identical and symmetrical selector stations operative to enable the selection of said selector means, independently from the longitudinal relative movement of the selector means in said selection canal, each selector station including one of two opposing electromagnets having poles disposed adjacent said selection canal in said inner portion thereof, said selector stations each including a magnetic adherence system in each of said outer portions of said selection canal for stabilizing said selector means before their arrival at said poles of said electromagnets, independently of the direction of relative movement of said selector means in said selection canal, and for amplifying said shifting of said selector means after their passage at said poles of said electromagnets, independently of the direction of relative movement of said selector means in said selection canal, each said selector station being formed of stacked parts, oriented in relation to each other by deformable wires lodged in spaces formed by face-to-face grooves of different parts, and each said selector station having a single positioning pin defining the position of said stacked parts of a said selector station in relation to each other and an orientation pin defining the orientation of said stacked parts of a said selector station about said positioning pin, said orientation pin being displaceably positioned in a groove such that thermal dilation of said electromagnet displaces said orientation pin in said groove in a direction transverse to said wires lodged in said spaces formed by said face-to-face grooves.

4,320,636

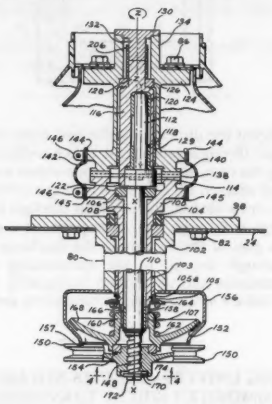
MECHANISM FOR ORBITING WASHER

Stephen L. McMillan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 12, 1980, Ser. No. 186,807

Int. Cl.³ D06F *23/00*

U.S. Cl. 68—23 R **11 Claims**



1. A washing machine for fabric articles comprising:

(a) a receptacle for receiving the fabric articles, said receptacle being mounted on a drive shaft in a substantially upright position and having a substantially vertical axis;

(b) drive means for said drive shaft rotatable in a first direction for rotating said receptacle about its axis;

(c) said drive means being rotatable in a second direction for effecting orbital movement of said receptacle about a second axis spaced from said receptacle axis;

(d) brake means for preventing rotation of said receptacle about its axis during said orbital movement of said receptacle; and

(e) biasing means for biasing said brake means toward its braking position;

(f) said drive shaft including a helical groove;

(g) said drive means including a drive member engaging said helical groove and engaging said brake means whereby rotation of said drive means in said first direction causes said drive member to move said brake means away from its braking position to permit rotation of said basket about its axis;

(h) said biasing means moving said brake means to its braking position upon discontinuance of rotation of said drive means in said first direction.

4,320,637

KEY REMOVABLE CYLINDER ASSEMBLY FROM LOCKET

Ming Y. Wu, Tainan, Taiwan, assignor to Jim Yu, Huntington Beach, Calif.

Filed Mar. 21, 1980, Ser. No. 133,500

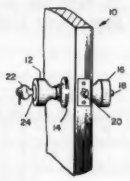
Int. Cl.³ E05B *13/10*

U.S. Cl. 70—224 **11 Claims**

1. In a lockset having a retractor housing and slide located in

a door for controlling a door latch, an outer knob having a cylinder and plug assembly mounted on a spindle located in the outer knob and movably attached to the retractor, an inside knob with movable locking device for preventing rotation of the retractor and a tailpiece extending from the retractor into the outer knob for independently controlling the retractor, the improvement comprising:

a washer having a central opening for accepting the tailpiece and removably attached to the end portion of the cylinder plug,



said washer having a diameter greater than the diameter of the plug thereby forming a shoulder,

a selected portion of said shoulder having a reduced diameter, and

a boss located on the inside diameter of said spindle facing towards the center of the outer knob and having a height approximating that of the shoulder on said washer whereby the cylinder and plug assembly is inserted in the outer knob and locked in place.

4,320,638

TUMBLER LOCK AND KEY

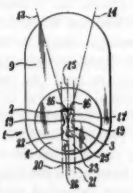
Gerald F. Dunphy, Glen Waverley, and Donald J. Newman, Somerville, both of Australia, assignors to Ogden Industries Pty. Limited, Huntingdale, Australia

Filed May 9, 1980, Ser. No. 148,532

Claims priority, application Australia, May 10, 1979, PD8754

Int. Cl.³ E05B *27/06*

U.S. Cl. 70—358 **31 Claims**



1. A key blank including:

an elongate blade having two oppositely-facing side surfaces, an upper-edge surface and a lower-edge surface, each of which extends between said side surfaces;

a dividing groove separating two laterally-spaced parts of said upper-edge surface and extending longitudinally inwards of said blade from an outer terminal end thereof;

a waisting groove in at least one of said side surfaces at a location adjacent to said upper-edge surface and extending longitudinally inwards of said blade from said outer terminal end, said waisting groove causing the width of said blade to reduce progressively away from a region adjacent said upper-edge surface to a region of minimum width which is located closer to said upper-edge surface than to said lower-edge surface; and

a zone of maximum width of said blade located below and adjacent to said region of minimum width.

4,320,639

DRIVERS DOOR LOCK FOR VEHICULAR ANTITHEFT LOCK SYSTEM

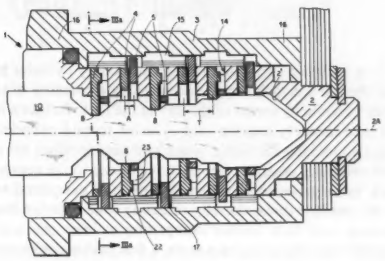
Frank Kleefeldt, Heiligenhaus, and Horst Brackmann, Velbert, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,225

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922431

Int. Cl.³ E05B *27/00*

U.S. Cl. 70—364 R **10 Claims**



1. A lock assembly comprising:

a tubular lock housing having an inner wall generally centered on an axis;

a core plug in said housing having an outer surface closely juxtaposed radially with said inner wall and a centrally axially extending key-receiving passage, said plug being rotatable in said housing about said axis between a pair of angularly offset end positions and through an intermediate position between said end positions;

pluralities of first and second tumblers alternating axially, exposed at said passage in said plug, and diametrally displaceable therein between outer positions projecting radially beyond said outer surface and inner positions lying radially within said outer surface, said plug being formed with a plurality of radially extending passages traversing said axial passage and each receiving one respective first tumbler and one respective second tumbler;

differently bitted first and second keys engageable in said passage with the respective tumblers to displace same into said inner positions;

an axially extending groove formed in said inner wall and forming at least one inwardly open first recess in radial alignment with said first tumblers only in one of said end positions of said plug, said first tumblers engaging in said first recess when in said outer positions and thereby preventing angular displacement of said plug from said one end position with said first tumblers in said outer position;

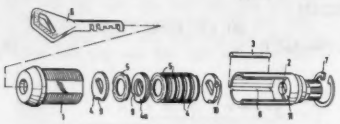
respective axially spaced and angularly extending grooves formed in said inner wall and forming at least one inwardly open second recess in said inner wall in radial alignment with said second tumblers only in and between said one end position and said intermediate position of plug, said second tumblers engaging in said second recess only in and between said one end position and said intermediate position when in said outer positions and thereby preventing angular displacement of said plug into the other end position with said second tumblers in said outer positions, whereby said plug can be turned between said one end and intermediate positions with said first key but can only be turned into said other end position with said second key; and

means including interengaging formations on said tumblers for displacing said first tumblers into said inner positions on displacement of the respective second tumblers by said second key into said inner positions.

4,320,640
ADJUSTABLE CYLINDER LOCK

Jaakko Martikainen, Joensuu, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Apr. 2, 1979, Ser. No. 26,294
Claims priority, application Finland, Apr. 6, 1978, 781052
Int. Cl.³ E05B *25/00, 29/00*
U.S. Cl. 70—366 **8 Claims**

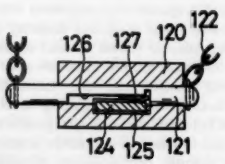


1. A cylinder lock comprising a stationary cylinder housing and therein a turnable cylinder inclosing a plurality of tumbler discs turnable by means of the key of the lock, further a locking bar non-turnably locking said cylinder to said cylinder housing, said locking bar being, when said tumbler discs are in their lock-releasing position, free to move closer to the center of the lock into a groove formed by alignment of peripheral recesses in the tumbler discs, thereby releasing said cylinder from said locking, said lock further comprising at least one composite tumbler disc including two parts, a first part and a second part, being angularly adjustably connected to each other, said first part being provided with a force transmitting surface engageable with said key, said first part being within an adjustment sector radially dimensioned so as to leave said locking bar free to move radially to its cylinder-releasing position, said second part of said composite tumbler disc having within said adjustment sector a support surface preventing said locking bar from moving radially to said cylinder-releasing position and having also a peripheral recess allowing said locking bar to reach said cylinder-releasing position, an adjustable clutch device being arranged between said first and second parts of said composite tumbler disc, said clutch device allowing setting of said first and second parts to a plurality of different, functionally fixed angular positions relative to each other.

4,320,641
KEY HOLDER

Minoru Toyoda, Nagoya, Japan, assignor to Aisin Seiki Company, Limited, Kariya, Japan

Division of Ser. No. 68,568, Aug. 22, 1979. This application Dec. 5, 1980, Ser. No. 213,561
Claims priority, application Japan, Sep. 8, 1978, 53-110845; Feb. 6, 1979, 54-13025; Feb. 6, 1979, 54-13026; Feb. 6, 1979, 54-13027; Feb. 6, 1979, 54-13028; Feb. 6, 1979, 54-13029
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 R **10 Claims**

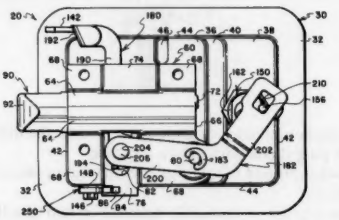


1. A pendant type key holder comprising:
a body having a first and second opening formed therein;
a chain for supporting said body;
a pole member slidably mounted in said first opening in said body and connected at opposite end portions thereof to said chain;
a key slidably mounted in said second opening in said body and movable between an operating position in which the key is disposed outside of said body and a non-operating position in which the key is housed within said body; and
means mounted in said body for limiting further sliding movement of said key upon being moved to said operating position.

4,320,642
PADDLE LOCKS WITH HANDLE DISCONNECT FEATURES

John V. Pastva, Jr., Parma Hts., Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,007
Int. Cl.³ E05B *55/04;* E05C *1/14*
U.S. Cl. 70—472 **13 Claims**



1. A door lock, comprising:
(a) a body structure, including:
(i) a generally pan-shaped body having a back wall and a side wall extending forwardly therefrom, the back wall and the side wall cooperating to define a forwardly-facing recess, the side wall including opposed, substantially parallel-extending side wall portions on opposite sides of the recess, and a front wall connected to the side wall and extending perimetrically about the side wall to define a substantially planar mounting flange which defines the perimeter of the body;
(ii) plate means connected to the back wall of the body and cooperating therewith to define a slide bolt passage and a disconnect member passage which intersect at a central location along the back wall, the slide bolt passage extending in a direction substantially paralleling the side wall portions, the disconnect member passage extending in a direction transverse to the direction of the slide bolt passage, the plate means having an elongate slot formed therethrough opening into the disconnect member passage near one end thereof and extending in a longitudinal direction substantially paralleling the direction of the disconnect member passage;
(b) an elongate slide bolt positioned in the slide bolt passage and being slidably carried therein for movement along a first path of travel between a latching position wherein the slide bolt is relatively extended with respect to the body structure, and an unlatching position wherein the slide bolt is relatively withdrawn with respect to the body structure, the slide bolt having a connecting formation provided thereon at a location near where the slide bolt extends across the disconnect member passage;
(c) a nestable handle structure, and shaft means for pivotally mounting the handle structure on the body structure for forward and rearward movement relative to the body structure between a normal position wherein the handle structure is relatively nested within the body recess, and an operating position wherein the handle structure is relatively extended with respect to the body recess, the shaft means extending in a direction substantially paralleling the direction of the disconnect member passage and having an end portion which extends through a hole formed in at least one of the opposed side wall portions of the pan-shaped body, an operating formation connected to the shaft means end portion and projecting rearwardly

with respect to the front wall of the pan-shaped body, the operating formation and the handle structure being drivingly connected such that the operating formation moves along a second path of travel relative to the body structure as the handle structure is moved between its normal and operating positions, the second path of travel being defined to lie within a plane which substantially parallels the direction of the first travel path;

(d) key-control means connected to the body structure and having a locking member which is movable relative to the body structure between locked and unlocked positions, the key-control means being operable to selectively retain the locking member in its locked and unlocked positions;

(e) an elongate disconnect member positioned in the disconnect member passage and being slidably carried therein for movement along a third path of travel extending longitudinally of the disconnect member passage, the disconnect member having one end which projects beyond the disconnect member passage and carries an abutment surface, the disconnect member being movable along the third travel path between a connecting position wherein the abutment surface intersects the second path of travel of the operating formation, and a disconnecting position wherein the abutment surface is withdrawn from the second travel path;

(f) pin means extending through the elongate slot formed in the plate means and connecting with the other end portion of the disconnect member for cooperating with the ends of the elongate slot to limit the range of sliding movement of the disconnect member along the third travel path, and for pivotally connecting the disconnect member and the plate means to enable the disconnect member to pivot relative to the body structure along a fourth path of travel which has the form of an arc with its center of radius being the locus of the pin means, the arc of the fourth travel path extending substantially parallel to the directions of the first and second travel paths;

(g) connecting means for:

(i) moving the disconnect member from its disconnecting position to its connecting position in response to movement of the locking member from its locked position to its unlocked position, whereby the abutment surface of the disconnect member is brought into the second travel path during such movement of the locking member to drivingly couple the operating formation and the disconnect member; and,

(ii) moving the disconnect member from its connecting position to its disconnecting position in response to movement of the locking member from its unlocked position to its locked position, whereby the abutment surface is withdrawn from the second travel path thereby preventing the operating formation from drivingly engaging the disconnect member when the operating formation moves along the second travel path; and,

(h) the disconnect member means being engageable with the connecting formation on the slide bolt to move the slide bolt from its latching position to its unlatching position when the disconnect member is moved along the fourth travel path in response to movement of the operating formation along the second travel path during movement of the handle structure from its normal position to its operating position.

4,320,643

METHOD AND APPARATUS FOR CORRECTING ASYMMETRICAL CONDITION IN ROLLING MILL

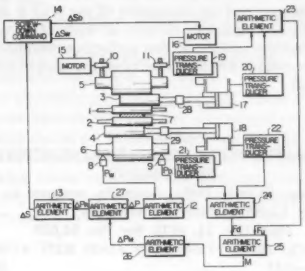
Ken-ichi Yasuda, and Shigeru Shida, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,816

Claims priority, application Japan, Jan. 17, 1979, 54-2961

Int. Cl.³ B21B *37/00, 31/18, 13/14*

U.S. Cl. 72—8 **6 Claims**



1. A method of correcting asymmetrical condition in a rolling mill in which predetermined rolls are displaced in the respective axial direction thereof during rolling operation, comprising steps of determining a real rolling load difference by eliminating rolling load change components due to a moment produced upon axial displacement of said rolls from a rolling load difference appearing across an operating side and a driving side of said rolling mill, and correcting said asymmetrical condition on the basis of said real rolling load difference.

4,320,644

METHOD AND APPARATUS FOR MANUFACTURE OF A VESSEL

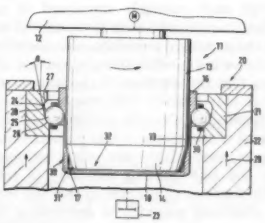
Karl Fischer, Am Gaensberg, 7519 Oberderdingen, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,692

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853957

Int. Cl.³ B21D *22/16*

U.S. Cl. 72—75 **16 Claims**



1. A method for manufacturing a stainless steel cooking vessel from a cup-shaped blank of stainless steel, the blank having a wall and a bottom, the bottom having a substantially planar bottom surface, comprising the steps of:

positioning the cup-shaped blank on a substantially cylindrical mandrel, the mandrel having an outer diameter corresponding to the finished inner diameter of the wall of the cooking vessel, except for a tapered end portion having a smaller diameter, the tapered portion and the blank defining an annular recess therebetween;

disposing an annular arrangement of at least five individually rotatable balls co-axially with the mandrel, the innermost

points of the at least five balls defining the finished outer diameter of the wall of the cooking vessel; and,

effecting a one-step rolling process, from the bottom of the cup-shaped blank upwardly, by axially displacing at least one of the mandrel and the annular arrangement of rotatable balls toward one another and rotating at least one of the mandrel and the annular arrangement of rotatable balls relative to the other, whereby the lower portion of the wall defining the annular recess is pressed inwardly and left relatively thick, the upper portion of the wall defining the annular recess is pressed inwardly and progressively made thinner and the remainder of the wall is made substantially and uniformly thinner, all without disrupting the planar bottom surface, so that no further machining operations are required to finish the outer surfaces of the bottom and wall.

4,320,645

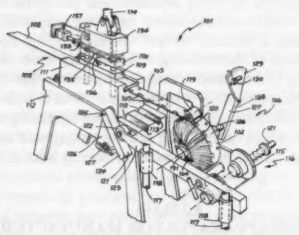
APPARATUS FOR FABRICATING ELECTRICAL EQUIPMENT

Louis Stanley, Beverly Hills, Australia, assignor to Card-O-Matic Pty. Limited, Waterloo, Australia

Filed Oct. 11, 1979, Ser. No. 84,039

Int. Cl.³ H02K *15/04;* H01F *41/06;* B21C *47/00*

U.S. Cl. 72—132 **15 Claims**



1. A punch and winding machine to manufacture a roll of punched strip, said machine including a main frame, a punching assembly mounted on the main frame and adapted to receive said strip and punch holes therein at predetermined intervals along the strip as the strip is drawn through the punching assembly, a winding assembly adapted to receive the punched strip and wind it into said roll, said winding assembly including a movable frame movably mounted on the main frame, a driven shaft rotatably supported on said movable frame and about which said strip is wound so as to feed the strip through the punching assembly, said movable frame being restrained to move in a predetermined direction relative to said main frame so that the location of application of the strip to said roll moves only radially with respect to said shaft, abutment means located to abut the periphery of the roll and to cause movement of said frame in said predetermined direction, control means to cause relative movement between said punching assembly and said winding assembly in response to an increase in the diameter of the roll so that the feed rate of the strip to said punching assembly is determined firstly by the diameter and rotation of said roll, and secondly by the relative movement between the punching and winding assembly, said control means including a first part attached to said movable frame so as to move therewith in said predetermined direction, and a second part attached to the punching assembly or main frame and operatively associated with said first part so as to cause said relative movement in response to movement of said first part in said predetermined direction, bias means biasing said roll to contact said abutment means, said bias means applying a substantially constant force to said roll in biasing it toward said abutment means, and winding drive means for said shaft to cause intermittent rotation thereof, punch drive means for said punching assembly, and co-ordination means coupling said winding drive means and said punch drive means so that said winding drive means causes rotation of said shaft in between punching operations.

4,320,646

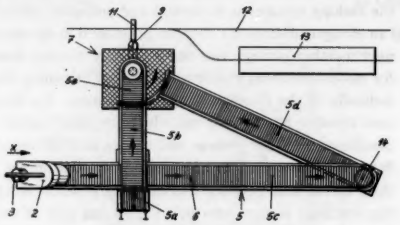
WIRE OR WIRE ROD COOLERS

Ali Bindernagel, Wermelskirchen; Ernst O. Blos, Hochdahl, and Hans Brauer, Leichlingen, all of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Dusseldorf, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,257

Int. Cl.³ B21B *43/04;* B21F *21/00;* C21D *8/06*

U.S. Cl. 72—201 **5 Claims**



1. A cooling conveyor arrangement for the cooling of hot-rolled wire or wire rod, comprising a loop-forming device for depositing the wire or rod in spread-out, mutually overlapping loops, a single coil-forming station for collecting the loops, a conveyor having at least two branches of different lengths for conveying the loops between the loop-forming device and the coil-forming station while the loops cool and transfer means on said conveyor for guiding the loops selectively onto portions of different lengths of the conveyor.

4,320,647

METHOD OF AND APPARATUS FOR MAKING ELEMENTS WITH PROFILED CROSS-SECTION FROM SHEET METAL

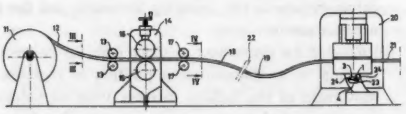
Jozef W. M. Kummeling, Leende, and Hermanus A. C. Holweg, Rosmalen, both of Netherlands, assignors to Volvo Car B.V., Helmond, Netherlands

Filed Feb. 20, 1980, Ser. No. 123,058

Claims priority, application Netherlands, Feb. 22, 1979, 7901424

Int. Cl.³ B21B *15/00, 27/02;* B26F *1/40*

U.S. Cl. 72—203 **5 Claims**



1. A method of making elements with profiled cross-section of sheet metal, more particularly plate elements having cams for transmitting power in a driving belt on which the elements are arranged in series next to and against each other running between cone pulleys, including the steps of: providing a steel strip in a rolling process with a middle groove running in longitudinal direction of the strip, continuously rolling said strip on both sides in a symmetrical fashion with respect to that groove to form two profiles, each of which having continuously in longitudinal direction the cross-section of the elements to be shaped; guiding said shaped strip through a punching press for punching out elements on both sides of the middle groove, of which a longitudinal direction lies in the direction of movement of the strip, and providing lines running in longi-

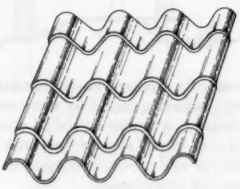
tudinal direction located at accurately predetermined distances on both sides of the groove to guide said punching.

4,320,648

METHOD FOR MAKING ROOFING

Bo Ekmark, Fältspatstigen 60, 951 64 Lulea, Sweden

Continuation of Ser. No. 955,217, Oct. 27, 1978, abandoned.
This application Dec. 24, 1980, Ser. No. 219,831
Claims priority, application Sweden, Nov. 10, 1977, 7712692
Int. Cl.³ B21D *13/10*
U.S. Cl. 72—301 2 Claims



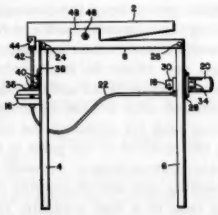
1. A method of making a roofing of sheet metal for outer roofs, characterized in that: a sheet is preformed so that it, in a first cross section perpendicular to the surface extension of the sheet, is given a section across the complete sheet which is curved to a configuration in the nature of a multiple wave, e.g., a sinus shape; the preformed sheet is then provided with stepped jags effectively constituting steps, where the height of the steps can be varied arbitrarily, by a stretch-pressing operation, wherein a pressing tool assembly is parted and at least consists of two pair of pressing and clamping tools; and where adjacent portions of the preformed sheet is first retained by each of the pair of tools in a clamping condition; with the clamping condition maintained, the two pairs of tools are thereafter then moved in an offset manner relative to each other in a direction normal to the sheet, a distance corresponding to the desired height of said steps so that the sheet in a second cross section, perpendicular to both the surface extension of the sheet and said first cross section, is given a formation of a step, whereafter the preformed sheet is advanced through a desired optional distance whereafter the step forming process is repeated to create additional steps.

4,320,649

CABLE STRAIGHTENER

Buddy S. Putney, 2515 E. Sweetwater Ave., Phoenix, Ariz. 85032

Filed Apr. 4, 1979, Ser. No. 26,930
Int. Cl.³ B21B *7/06*
U.S. Cl. 72—389 2 Claims



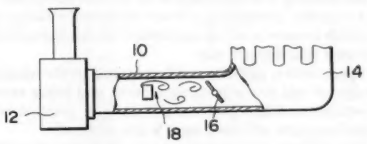
1. An apparatus for straightening cable, comprising:
first means disposed to permit said cable to be positioned for supporting said cable;
striking means pivotably coupled to said first means for striking said cable at a desired point;
said striking means provided with inclined surface means for permitting kinks exhibiting various degrees of distortion to be positioned along said first means in a tranverse direction thereto and in communication with at least a portion of said inclined surface of said striking means at a location in proportion to said degree of distortion;
means having an actuator pedal for activating said striking means;
said first means comprising first and second substantially horizontal supporting members coupled together in a spaced relationship;
said striking means further comprising a lever having first and second ends;
said first end coupled to said activating means;
said second end for striking said cable;
said lever pivotably coupled to said first means at a point on said lever intermediate said first and second ends;
said striking means yet further comprising third means coupled to said first end and capable of upward movement; and
said striking means still further comprising fourth means for supplying said third means with compressed air to initiate said upward movement.

4,320,650

FLOW RATE MEASURING APPARATUS HAVING VORTEX-GENERATING ELEMENT AND HOT WIRE ELEMENT

Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 7, 1980, Ser. No. 147,608
Claims priority, application Japan, May 11, 1979, 54-56962
Int. Cl.³ G01F *25/00, 1/32, 1/68*
U.S. Cl. 73—3 11 Claims

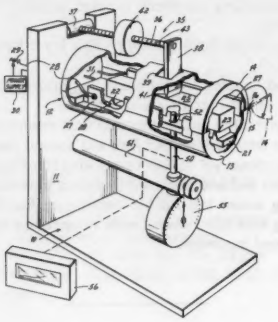


1. An apparatus for measurement of the velocity or the rate of flow of a fluid flowing through a conduit, comprising:
an elongate vortex-generating body disposed in the conduit transversely across the conduit to create a Karman vortex street in the flowing fluid;
at least one electrically heatable wire stretched in the conduit;
first transducer means for detecting the frequency of shedding of Karman vortices from said vortex-generating body and producing a first flow rate signal based on the detected frequency;
second transducer means for detecting a cooling effect of the flowing fluid on said at least one wire while said at least one wire is electrically heated and producing a second flow rate signal based on the detected cooling effect; and
output signal selection means for selectively putting out one of said first and second signals as an output signal of the apparatus depending on flow conditions in the conduit such that said first signal is put out while the fluid is flowing under predetermined flow conditions where generation of Karman vortices by said vortex-generating body occurs stably but said second signal is put out when the fluid is not flowing under said predetermined flow conditions.

4,320,651
HOT DEFORMATION TESTING METHOD AND APPARATUS

William L. Tordoff, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 20, 1980, Ser. No. 132,262
Int. Cl.[3] G01N 3/18, 3/20
U.S. Cl. 73—15.6 4 Claims



1. A hot deformation tester comprising,
a chamber,
a pair of horizontally-spaced supports in said chamber for receiving and supporting an elongated core sample,
a force applicator centered above said supports and adapted to apply a force to the upper surface of a core sample mounted on said supports,
a deflection probe located between said supports and engageable with the underside of said core sample,
means connected to said probe for displaying the magnitude of movement of said probe,
heaters disposed in said chamber for raising the temperature surrounding said core sample to at least about 600° F.,
said chamber comprising a lower elongated housing section which is open at its top and which has a longitudinal edge at one side thereof, and
an upper cover, said cover being hinged to the longitudinal edge of said lower housing section, and being swingable between a closed position and an open position wherein said supports and core sample are exposed.

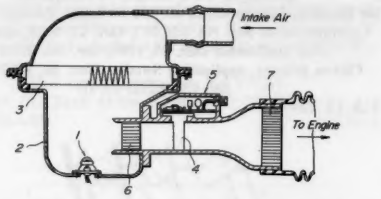
4. The method of determining the suitability of a sand and binder combination for cores which are to be used in metallic molds comprising the steps of,
mixing the binder with sand,
forming an elongated core from said sand and binder mixture,
supporting said core at its ends while placing a weight at its center portion,
subjecting said core to a temperature of at least about 600° F., and
measuring the deflection of the center portion of said core.

4,320,652
INTAKE AIR DENSITY SENSOR FOR AN INTERNAL COMBUSTION ENGINE

Koyo Nakamura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1979, Ser. No. 88,553
Claims priority, application Japan, Nov. 13, 1978, 53-139667
Int. Cl.[3] G01N 9/32
U.S. Cl. 73—30 8 Claims

1. An air density sensor comprising:
a high thermal conductivity receptacle having a fine diameter tubular portion;
a pressure responsive casing at least whose part is made of an elastic membrane and communicated with said receptacle;
a gas and a nonconductive liquid having a light specific gravity together with a small amount of a conductive liquid and hermetically sealed in said receptacle and pressure responsive casing to form a thin film of the conductive liquid between the gas and nonconductive liquid in the tubular portion of said receptacle; and

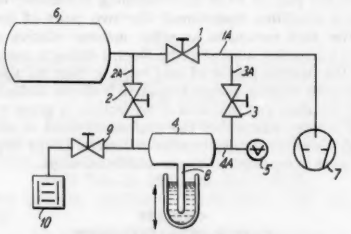


a resistor longitudinally arranged in said tubular portion so as to form short-circuiting means by said conductive liquid for said resistor, whereby values of electrical resistance between ends of said resistor vary with movements of said thin film of said conductive liquid in response to outer pressures and temperatures.

4,320,653
METHOD OF AND APPARATUS FOR MEASURING THE RATE OF LEAK

Karl-Heinz Bernhardt, Braunfels, Fed. Rep. of Germany, assignor to Arthur Pfeiffer-Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Jul. 8, 1980, Ser. No. 166,797
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928336
Int. Cl.[3] G01M 3/32
U.S. Cl. 73—40 10 Claims



1. Method of measuring the rate of leak in a test object subjected to the establishment of vacuum conditions and in which test object liquids and/or their vapors are present, using the pressurized method and measuring the absolute pressure, wherein the improvement comprises connecting a measuring tank to the test object and valving the connection for selectively interconnecting the measuring tank and the test object, evacuating the test object and measuring tank, providing the measuring tank and test object in intercommunication for equalizing the pressure therebetween and closing off the interconnection therebetween after a time, removing the vapors within the measuring tank for reducing the partial pressure therein, measuring the pressure of the gases in the measuring tank, providing intercommunication between the vacuum pump and the measuring tank and evacuating the test object and the measuring tank to a final pressure, closing off the vacuum pump and the measuring tank while affording intercommunication between the test object and the measuring tank for effecting pressure equalization therebetween, closing off the intercommunication between the test object and the measuring tank, removing the vapor contents of the measuring tank for reducing the partial pressure therein, measuring the pressure in the measuring tank and based on the measured pressures and the time difference determining the rate of leak.

4,320,654
SYSTEM FOR DETECTING CRACKS IN THE HEAT-INSULATING LINING OF A CONTAINER FOR LIQUEFIED GAS

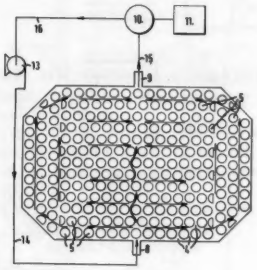
Michael H. Collins, Huxley, near Chester, England, assignor to Shell Internationale Research Maatchappij, The Hague, Netherlands

Filed Apr. 14, 1980, Ser. No. 140,154

Claims priority, application United Kingdom, May 29, 1979, 18657/79

Int. Cl.³ G01M *3/04*

U.S. Cl. 73—40.7 **8 Claims**



1. A system for detecting cracks in the heat-insulating lining of a container for liquefied gas having a rigid outer shell internally provided with a heat-insulating lining, wherein the crack detecting system comprises a channelled layer having studs spaced apart in such a manner that channels are formed between the studs, wherein the studs are so arranged that the gas flow resistance properties of the channelled layer are different in different directions parallel to the channelled layer, wherein the channelled layer is incorporated in the lining and extends along a wall area which has to be watched for the presence of a crack in the lining of said area, the channelled layer is provided with a gas inlet and with a gas outlet for purging gas, and means are present for the supply of purging gas to the gas inlet and for the discharge of purging gas from the gas outlet to a gas-analyzer, and wherein the studs in the channelled layer are so arranged along the whole area to be watched that the directional gas flow resistance properties of the channelled layer cause the purging gas to flow through the channels in the channelled layer from the gas inlet to the gas outlet in such a manner that the purging gas is uniformly distributed along the whole area to be watched.

4,320,655
QUANTITY OF FLOW METER

Johann Kammermaier, Unterhaching; Rüdiger Mueller, Munich, and Peter Roedl, Rosenheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,352

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925975

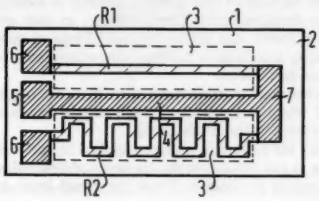
Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **10 Claims**

1. In a flow meter of the type in which a flowing medium is directed past two electrical conduction elements which have a current passing therethrough, one of the conduction elements constituting a measuring resistor which is heated by the current and the other constituting a comparator resistor which is not heated by the current to any practical extent, and in which the measuring and comparator resistors are for connection in a bridge which has a tap and which is connected to a regulator circuit for controlling the current through the bridge in response to the voltage arising at the tap, the change in bridge current representing the quantity of the flowing medium, the improvement therein comprising:

a carrier;

a first thin layer resistor carried on said carrier as said measuring resistor; and



a second thin layer resistor carried on said carrier as said comparator resistor and having a resistance value which is at least ten times that of said measuring resistor.

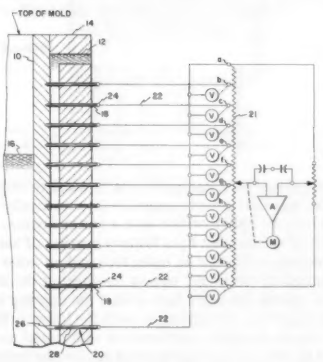
4,320,656
THERMOCOUPLE APPARATUS FOR INDICATING LIQUID LEVEL IN A CONTAINER

John R. Tiskus, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1980, Ser. No. 173,220

Int. Cl.³ G01F *23/72*

U.S. Cl. 73—295 **1 Claim**



1. In apparatus for indicating the level of a heated liquid in a container having an internally cooled wall, said wall having an interior face heated by the liquid and an exterior face subject to a substantially variable temperature environment, said apparatus including a group of thermocouple elements of first polarity connected to said wall at spaced vertical locations above and below said liquid, said elements being connected proximate the face of said wall heated by the liquid and extending to a location adjacent the exterior face of said wall, a thermocouple element of opposite polarity comprising the portion of said container wall to which said elements of first polarity are connected, a conductor probe of material equivalent in thermoelectric characteristics to said wall connected thereto proximate the face thereof heated by said liquid and extending to a location adjacent the exterior face of said wall, a slidewire resistor, said elements of first polarity being connected respectively to points spaced on said resistor corresponding to said spaced locations in the container wall, said probe being connected to a point on said resistor corresponding to a location above the uppermost thermocouple element so as to apply a reference voltage at said point, and means for

locating a position on said resistor corresponding to the liquid level in said container,

the improvement in said apparatus which comprises:

one of said probe and group of elements of first polarity, passing through the internally cooled portion of said wall and having substituted for a portion of the length thereof, (a) in the case of said probe a material of substantially the same thermoelectric characteristics as said elements of first polarity, and (b) in the case of said elements of first polarity a conductor substantially equivalent to the material of said probe,

said substituted portion extending from the region of said wall which is internally cooled to said location adjacent the exterior face of the mold,

whereby the reference voltage supplied to said resistor is the same as the voltage of the elements of first polarity which happen to be located above the liquid level in the container.

4,320,657

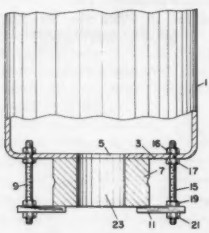
PARTICULATE FLOWMETER

Joseph L. Johnson, III, Hockessin, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Apr. 29, 1980, Ser. No. 144,917

Int. Cl.³ G01F *15/00*

U.S. Cl. 73—432 R **6 Claims**



1. An apparatus for determining the flowability of powdered or granular material which comprises (a) a vertically disposed vessel having an upper orifice and a lower orifice, (b) said lower orifice surrounded by a bottom portion of said vessel which bottom portion has an inner face and an outer face, (c) a pharmaceutical tablet die, having an opening therethrough, positioned against the outer face so that the opening in the die is in unobstructive communication with the lower orifice, (d) a hollow column centrally positioned in said vessel so that the lower end of said column is positioned against the inside face of said vessel, and (e) a moveable retaining means mounted on said vessel to hold said die in tight contact with the said outter face.

4,320,658

WEIGHING APPARATUS

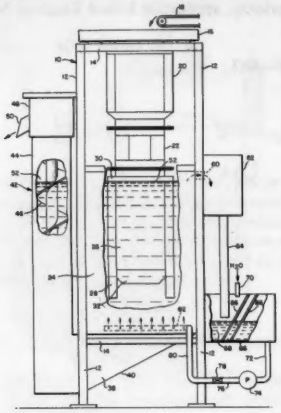
Barney W. Hilton, Dallas; Robert I. Lin, Irving, and Greg Crnkovich, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Sep. 3, 1980, Ser. No. 183,739

Int. Cl.³ G01N *9/10*; G01G *19/00, 5/02*

U.S. Cl. 73—437 **13 Claims**

1. An apparatus suitable for use in weighing free-flowing, solid, particulate, food material having water therein comprising scale means, a first chamber for containing said food material in fixed position, a second chamber for containing said food material in fixed position, means for charging said food material to one of said chambers, passage means for passage of said food material between said first and second chambers, said first and second chambers and said passage means being suspended in essentially fixed, vertical position from said scale means, vessel means in which one of said chambers is positioned, said chamber in said vessel being foraminous, said vessel being suitable for containing water in a substantially quiescent state at a level of water sufficient for submerging said food material in said water in said foraminous chamber, means for maintaining a substantially constant level of water in said vessel, said scale means being suitable for weighing said first and second chambers and said passage means with said level of water being maintained and with a given charge of said food material



in one of said chambers and for weighing said first and second chambers and said passage means with said level of water being maintained and said charge of said food material being in the other of said chambers submerged in said water, means for discharging food material from said foraminous chamber, and means for discharging food material from said apparatus after said weight determinations with said food material in said chambers has been made.

4,320,659

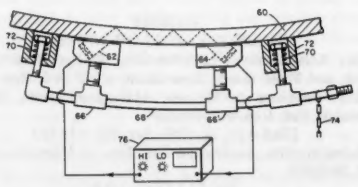
ULTRASONIC SYSTEM FOR MEASURING FLUID IMPEDANCE OR LIQUID LEVEL

Lawrence C. Lynnworth; John L. Seger, both of Waltham, and James E. Bradshaw, Tyngsboro, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 881,754, Feb. 27, 1978, abandoned. This application Jan. 11, 1980, Ser. No. 111,466

Int. Cl.³ G01N *29/02*

U.S. Cl. 73—589 **54 Claims**



1. An ultrasonic system for measuring at least one selected impedance related parameter of a fluid comprising

a solid member capable of supporting the propagation of moderately directional, bulk SV shear waves without mode conversion,

transducer means acoustically coupled to said member for generating and detecting said SV waves propagated along a multiply-reflected path that includes at least two reflections in a region of said member remote from said transducer means and is at least partially immersed in said fluid to form a solid-fluid interface, said reflections having an

angle of incidence that exceeds the first critical angle by at least five degrees and is at least ten degrees less than the second critical angle,

said path lying in a portion of said member that is substantially homogeneous and flaw free and said SV waves having a frequency that lies in the range of 0.5 to 5 MHz to minimize energy loss by absorption and maximize energy loss by coupling to said fluid at said reflections in said remote region, and

means for sensing the attenuation of said waves along said path at said interface to measure said selected impedance related parameter.

4,320,660

FRESNEL FOCUSSED IMAGING SYSTEM

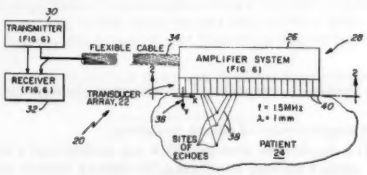
Roger H. Tancrell, Cambridge, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 962,571, Nov. 20, 1978, Pat. No. 4,228,686, which is a continuation-in-part of Ser. No. 866,325, Jan. 3, 1978, Pat. No. 4,145,931. This application Jun. 2, 1980, Ser. No. 155,324

The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **7 Claims**



1. An imaging system comprising:

an array of radiating elements oriented toward a subject for communicating radiant energy between said array and a site within said subject;

first means for generating a first group of signals modulated in the format of a cosinusoidal Fresnel pattern;

second means for generating a second group of signals modulated in the format of a sinusoidal Fresnel pattern;

corresponding signals of each of said groups being coupled to respective ones of said radiating elements; and

means for combining said corresponding signals to form a Fresnel signal pattern for said array to provide a focal point for said radiant energy adjacent said array.

4,320,661

ELECTROMAGNETIC ACOUSTIC TRANSDUCER FOR TUBE INSPECTION

William E. Peterson; Robert B. Thompson, both of Thousand Oaks, Calif., and Carmine F. Vasile, Lloyd Neck, N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

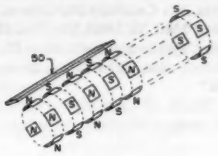
Filed Oct. 19, 1979, Ser. No. 86,512

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—643 **5 Claims**

1. A transducer for use in ultrasonic testing of a tubular product comprising

a plurality of means for establishing periodic magnetic fields equally spaced about the inner surface of a tubular body, each of said means comprising a row of permanent magnets of alternating polarity and alignable parallel to the axis of said tubular product, said plurality of means being equally spaced about the circumference of said inner surface, and



means for conducting a current through said magnetic fields whereby selected modes of vibration are established in said tubular body.

4,320,662

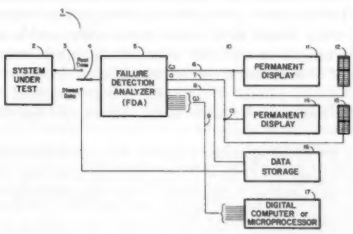
FAILURE DETECTION ANALYZER

Stanley R. Schaub, 11, rue Galgenberg, Junglinster, and Peter Van Vliet, 5, Ave. Principale, Kahler, both of Luxembourg

Filed Feb. 22, 1978, Ser. No. 880,072

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—660 **6 Claims**



1. An apparatus for providing measurements indicative of substantially, instantaneous absolute speed of a rotating element which is a member of a mechanical or electro-mechanical apparatus comprising:

(a) speed sensing means coupled to said rotating element and responsive to rotation thereof through indicative, small angles of revolution of said rotating element for generating a signal for each occurrence of small angle rotation thereof, said angles each being a fraction of a full-cycle of operation (i.e. one revolution);

(b) means responsive to at least one said signal for providing an indication of one revolution of said rotating element;

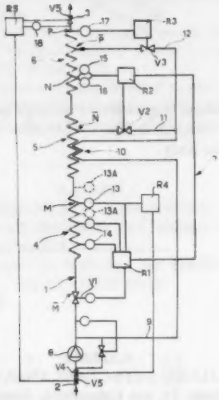
(c) signal processing means responsive to successive pair of said small angle rotation signals for providing elapsed time measurements between said small angles;

(d) additional signal processing means for providing substantially, absolute speed indication measurements on a small angle signal by small angle signal basis from successive elapsed time measurements, the said absolute speed measurements being inversely proportional to the said elapsed time measurements and being expressed in dimensions of degrees per unit of time; whereby anomalies in said apparatus at sub-cyclic intervals may be detected.

4,320,663
CONTROL SYSTEM AND METHOD FOR CONTROLLING A SOLAR ENERGY PLANT

Giovanni Francia, Via Casaregis 34, Genova, Italy

Filed Mar. 20, 1980, Ser. No. 132,345
Claims priority, application Italy, May 17, 1979, 68045 A/79
Int. Cl.[3] F22D 5/26
U.S. Cl. 60—667 26 Claims



1. In a solar energy plant for the production of superheated steam of the type comprising a solar energy boiler having pre-heating, evaporation, and superheating stages through which a flow of water is arranged to successively pass between an inlet and an outlet of the boiler to transform the water from a liquid state into a superheated steam state, and a control system arranged to maintain constant the temperature and volume of superheated steam at the outlet of the boiler in the presence of variations of the solar energy absorbed by the boiler, the improvement wherein the said control system comprises:

means for dividing water entering through said boiler inlet into a main water flow to be passed successively through said pre-heating, evaporation, and super-heating stages, and a secondary water flow,

means for injecting a first part of the said secondary water flow into said evaporation stage and a second part of the secondary water flow into said superheating stage,

a main control loop for varying the flow rate of the main water flow as a function of the water temperature at a first point situated towards the downstream end of said pre-heating stage, the main control loop in operation acting to maintain the water temperature at said first point substantially equal to a desired value,

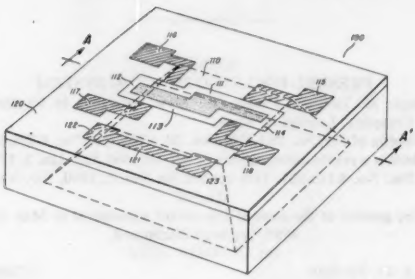
a first auxiliary control loop for varying the flow rate of the said first part of the secondary water flow as a function of the temperature T and the pressure p of the steam at a second point located in said superheating stage adjacent the upstream end thereof, said first auxiliary control loop in operation acting to maintain the value of the expression t-ap-b substantially equal to zero where a and b are two experimental constants dependent on the proportion of solar energy absorbed in the section of the boiler downstream of the said second point, and

second auxiliary control means for varying the flow rate of the said second part of the secondary water flow as a function of the temperature of the superheated steam at a third point situated adjacent the said outlet of the boiler, the second auxiliary control means in operation acting to maintain this superheated-steam temperature substantially constant.

4,320,664
THERMALLY COMPENSATED SILICON PRESSURE SENSOR

Larry A. Rehn, Rowlett, and Roy W. Tarpley, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1980, Ser. No. 124,417
Int. Cl.[3] G01L 19/04, 9/06
U.S. Cl. 73—708 10 Claims



1. A thermally compensated silicon pressure sensor comprising:

(a) a single crystal of silicon including:

(1) a diaphragm portion with a top surface and a bottom surface, having a thickness permitting flexure when a pressure differential is applied between said top surface and said bottom surface and having a continuous loop resistor element disposed adjacent to said top surface in a position for exhibiting piezoresistivity when said diaphragm is flexed, a first resistor disposed in a central portion of said diaphragm portion, a second resistor connected to said first resistor and disposed in a peripheral portion of said diaphragm portion, a third resistor connected to said second resistor and disposed in a central portion of said diaphragm portion and a fourth resistor connected to said first and third resistors and disposed in a peripheral portion of said diaphragm portion; and

(2) a clamp ring portion disposed around the entire perimeter of said diaphragm portion having a thickness providing mechanical support to said diaphragm portion and permitting virtually no flexure of said clamp ring portion when a pressure differential is applied between said top surface and said bottom surface of said diaphragm portion, and further having a temperature sensitive resistor disposed therein;

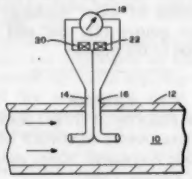
(b) a first set of electrical terminals including a first electrical terminal disposed in ohmic contact with said continuous loop resistor element at the connection between said first and second resistors, a second electrical terminal in ohmic contact with said continuous loop resistor element at the connection between said second and third resistors, a third electrical terminal in ohmic contact with said continuous loop resistor element at the connection between said third and fourth resistors and a fourth electrical terminal disposed in ohmic contact with said continuous loop resistor element at the connection between said first and fourth resistors; and

(c) a second set of electrical terminals disposed in ohmic contact with said temperature sensitive resistor.

4,320,665
METHOD AND MEANS FOR MEASURING FLOW OF A TWO PHASE FLUID

David G. Cain, Los Altos, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 17, 1979, Ser. No. 104,121
Int. Cl.³ G01F 1/46, 1/74
U.S. Cl. 73—861.04 9 Claims



1. The method of measuring flow of a two phase fluid in a transmission line comprising the steps of:

determining dynamic fluid pressure within said transmission line by measuring static fluid pressure within said line with a first Pitot tube, measuring absolute fluid pressure within said line with a second Pitot tube, and determining dynamic fluid pressure of said fluid from said measured static and absolute fluid pressures,

applying a signal through said second Pitot tube to said fluid,

detecting any return signal in said second Pitot tube,

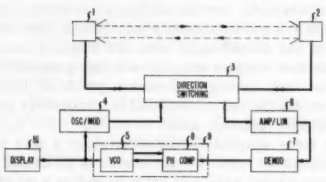
determining the phase of said fluid from said return signal, and

determining fluid flow from said dynamic fluid pressure and said fluid phase.

4,320,666
FLUID FLOW MEASURING APPARATUS

Robert J. Redding, September House, Cox Green La., Maidenhead, Berkshire SL6 3EL, England

Filed Jul. 20, 1979, Ser. No. 59,276
Claims priority, application United Kingdom, Jul. 22, 1978, 30774/78
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 7 Claims



1. Fluid flow measuring apparatus comprising:

means to generate an electrical carrier signal;

means to generate a modulation signal;

means to frequency modulate the carrier signal in accordance with the modulation signal;

first and second transducers which are spaced-apart along the fluid flow;

means to feed the modulated carrier signal to one of said transducers so that said transducer transmits ultrasonic energy through the fluid to be received by the other transducer;

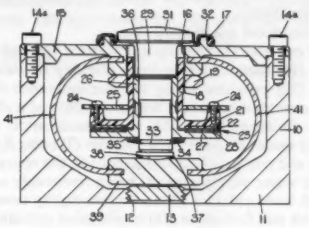
a phase-locked loop to maintain a fixed relationship between the phase of the modulation fed to the transmitting transducer and the phase of the modulation received by the receiving transducer by adjustment of the frequency of said modulation signal; and

means responsive to said frequency of said modulation signal to indicate speed of fluid flow.

4,320,667
LOAD TRANSDUCER

John S. Forrester, West Midlands, and David Rendall, Plymouth, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 5, 1979, Ser. No. 82,057
Claims priority, application United Kingdom, Oct. 17, 1978, 40866/78
Int. Cl.³ G01L 1/14
U.S. Cl. 73—862.64 11 Claims



1. A transducer including a hollow body, a movable control element, means mounting the control element in the body for sliding movement relative to the body, the control element extending through the body to an external surface of the body so that a movement of an external body can be imparted to the control element in one direction relative to the body, a first carrier member movable with the control element in said one direction relative to the body, a second carrier member fixed relative to the body at least during movement of the first carrier member, a variable capacitor including first and second electrodes, the first electrode being supported by the first carrier member and including a first surface extending perpendicular to said one direction, and the second electrode being supported by the second carrier member and including a second surface which extends in parallel spaced relationship with the first surface such that movement of the first carrier member relative to the second carrier causes the distance between said surfaces to vary, while said surfaces remain in parallel relationship, whereby the capacitance of the capacitor varies substantially inversely with the distance between said surfaces, and electrical oscillator circuit means, including said capacitor, for providing an output signal having a frequency which is inversely proportional to said capacitance and hence directly proportional to the distance between the electrodes.

4,320,668
SUB-LANCE ASSEMBLY FOR SAMPLING AND TEMPERATURE-MEASURING OF MOLTEN METAL DURING REFINING THEREOF

Akira Honda, Kamakura; Shinobu Kumagai, and Hiroyuki Takita, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1980, Ser. No. 127,217
Claims priority, application Japan, Mar. 28, 1979, 54-35663
Int. Cl.³ G01N 1/12
U.S. Cl. 73—863.11 4 Claims

1. In a sub-lance assembly for sampling and temperature-measuring of a molten metal during refining thereof, which comprises:

a sub-lance (4) having a concentric three-pipe structure comprising a gas supply pipe (10), a water supply pipe (8) and a water discharge pipe (9) with said gas supply pipe as the center pipe, said gas supply pipe, said water supply pipe and said water discharge pipe being assembled and fixed to each other, said sub-lance being rotatably and

releasably fitted to a sub-lance carriage (2) in the substantially vertical position by a receiving stand fixed to the upper end portion of said sub-lance carriage and a sub-lance supporting device fixed to the lower end portion of said sub-lance carriage, said sub-lance carriage being adapted to move up and down along a guide rail provided vertically on a turning frame;

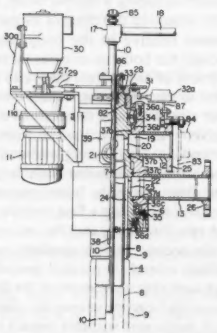
a probe, releasably fitted to the lowermost end of said gas supply pipe, for sampling and temperature-measuring of the molten metal during refining thereof;

a drive mechanism for rotating said sub-lance around the axial line thereof; and

a sub-lance rotation angle detector, fitted to the tip of the axle of said drive mechanism, said sub-lance rotation angle detector being adapted to detect the angle of rotation of said sub-lance;

the improvement comprising:

an inner cylinder (7) defining a first space (21) and a second space (24) therein and having a plurality of water supply holes (20) provided along the circumference thereof in communication with said first space (20) and a plurality of water discharge holes (23) in communication with said second space (24), said inner cylinder (7) being fixed to the upper end portion of said sub-lance (4), the uppermost end of said water supply pipe (8) being removably connected to said inner cylinder (7) and water-tightly communicating with said first space (21) in said inner cylinder (7), said



first space (21) water-tightly communicating with said plurality of water supply holes (20) provided along the circumference of said inner cylinder (7), the uppermost end of said water discharge pipe (9) being removably connected to said inner cylinder (7) and water-tightly communicating with said second space (24), said second space (24) being located between said inner cylinder (7) and said water supply pipe (8) and water-tightly communicating with said plurality of water discharge holes (23), the lowermost end portions of said water supply pipe (8) and said water discharge pipe (9) water-tightly communicating with each other, the uppermost end of said gas supply pipe (10) projecting above said inner cylinder (7);

an outer cylinder (6) including a water supply branch pipe (12) and a water discharge branch pipe (13) fixedly mounted to said outer cylinder (6), said outer cylinder (6) rotatably engaging said inner cylinder (7) through bearing means (34,35) and sealing means (36*a*–36*d*), said outer cylinder (6) being connected to said sub-lance carriage (2) to prevent said outer cylinder (6) from rotating together with said sub-lance (4) and said inner cylinder (7) when said sub-lance (4) is rotated together with said inner cylinder (7) by means of said drive mechanism (11); and

a first annular groove (19) and a second annular groove (22) provided between the inner surface of said outer cylinder (6) and the outer surface of said inner cylinder (7), said first annular groove (19) water-tightly communicating with said plurality of water supply holes (20) and said water supply branch pipe (12), and said second annular groove (22) water-tightly communicating with said plurality of water discharge holes (23) and said water discharge branch pipe (13):

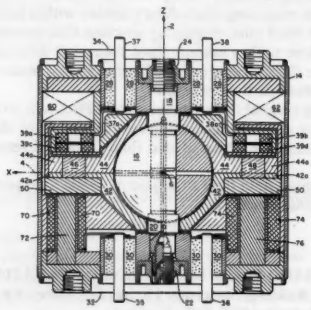
whereby cooling water is directed through said water supply branch pipe (12), said first annular groove (19), said plurality of water supply holes (20) and said first space (21) into said water supply pipe (8), and then discharged through said water discharge pipe (9), said second space (24), said plurality of water discharge holes (23), said second annular groove (22) and said water discharge branch pipe (13) to the outside.

4,320,669

TWO DEGREE OF FREEDOM GYRO HAVING AN AXIAL GAP PERMANENT MAGNET MOTOR

Lester R. Grohe, East Weymouth, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Mar. 5, 1979, Ser. No. 17,446
Int. Cl.[3] **G01C** *19/08, 19/28, 19/30*
U.S. Cl. 74—5.37 **11 Claims**



9. An accelerometer comprising first, second, and third two degree of freedom gyros coupled to a platform and a computing means,

wherein each of said gyros comprises:

A. a stator including two sets of series connected coils wound in quadrature, each set of coils being disposed in a substantially annular configuration about a spin reference axis and substantially parallel to a plane defined by first and second input axes, said first and second input axes and said spin reference axis being mutually orthogonal and having a common point of intersection, wherein the axis of each coil is substantially parallel to said spin reference axis,

B. a rotor adapted for rotation about a spin axis, and adapted for rotational displacements about said first and second input axes, said rotor including a set of permanent magnets disposed in a substantially annular configuration about said spin axis, said annular configuration of magnets having substantially the same mean radius as said annular configuration of coils, and wherein the magnetic moment of each of said magnets is substantially parallel to said spin axis, and wherein the magnetic moments of adjacent magnets in said set are oppositely directed,

C. means for positioning said rotor with respect to said stator whereby said annular configuration of magnets is adjacent to said annular configuration of coils so that magnetic flux from said magnets is coupled to said coils,

D. return means connected to said rotor for establishing a magnetic flux return path therein, said return path completing a circuitous path for magnetic flux passing through said coils,

E. means for exciting said sets of coils including servo

means for detecting back emf in said sets of coils and for generating control signals related thereto for driving alternating currents in the respective sets of coils, said currents having a 90° relative phase shift and being in-phase with the detected back emf for the respective sets of coils,

F. first and second means for detecting rotational displacements of said rotor about said first and second input axis, respectively, relative to said stator, and for generating first and second balance control signals representative thereof, and

G. first and second torquer means connected to said housing member and responsive to said first and second balance control signals for applying torque to said rotor about said first and second input axes, respectively, whereby said spin reference and spin axes are maintained substantially coaxial,

wherein the spin reference axis of said first gyro is aligned with a first reference axis and the rotor of said first gyro is non-pendulous, and said first gyro includes means for generating a first gyro signal representative of the angular velocity of said platform about second and third reference axes, said first, second and third reference axes being mutually orthogonal,

wherein the spin reference axis of said second gyro is aligned with said second reference axis and the rotor of said second gyro is pendulous, and said second gyro includes means for generating a second gyro signal representative of the angular velocity of said platform about said first and third reference axes and the linear acceleration of said platform along said first and third reference axes,

wherein the spin reference axes of said third gyro is aligned with said third reference axis and the rotor of said third gyro is pendulous, and said third gyro includes means for generating a third gyro signal representative of the angular velocity of said platform about said first and second reference axes and the linear acceleration of said platform along said first and second reference axes, said acceleration portion of said third gyro signal being opposite in polarity from the corresponding portion of said second gyro signal, and

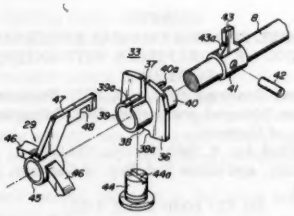
wherein said computing means is responsive to said first, second and third gyro signals to generate separate output signals representative of the acceleration and angular velocity of said platform with respect to each of said first, second, and third reference axes.

4,320,670

SHIFT INTERLOCK MECHANISM OF A VEHICLE POWER TRANSMISSION

Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1980, Ser. No. 115,282
Claims priority, application Japan, Jan. 30, 1979, 54/9865
Int. Cl.³ G05G *5/10*
U.S. Cl. 74—477 **2 Claims**



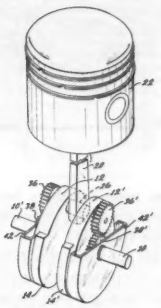
1. A shift interlock mechanism for a vehicle transmission including a control shaft which is rotated or axially moved by manually operating a control lever to effect selecting operation or shifting operation of different speed gears, the mechanism comprising a shift lever fixedly mounted on the control shaft, an interlock plate formed with a slot axially slidably engaging the shift lever, and a pair of cylindrical members disposed on opposite sides of the interlock plate and formed integrally with the interlock plate and coaxially with the control shaft, each of the cylindrical members being formed with a longitudinal slot which is of the same width as the slot of the interlock plate, the slots of the cylindrical members being contiguous with the slot of the interlock plate.

4,320,671

CRANKSHAFT COUNTERBALANCING

Robert R. Curasi, 4104 Ash St., Dunsmuir, Calif. 96025

Continuation-in-part of Ser. No. 909,365, May 25, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,653
Int. Cl.³ F16C *3/04*
U.S. Cl. 74—604 **9 Claims**



1. In mechanism including a shaft, a cylinder having an axis, a reciprocating piston, connecting rod and crankpin means for driving the shaft, the crankpin means having top dead center and bottom dead center positions with respect to said axis, means for counterbalancing through 360° including said mechanism having a first conventional counterbalancing mass means rotatable around the shaft, which align with the connecting rod and said axis at bottom dead center and at top dead center positions, second counterbalancing mass means, drive means whereby the second counterbalancing mass means is rotated about the axis of the shaft, said drive means being constructed to rotate the said second counterbalancing mass means relatively so that at both top dead center and bottom dead center positions of the crank pin means the second counterbalancing means are at bottom dead center position.

4,320,672

INTER HOUSING SPEED TRANSMISSION HUB FOR BICYCLES

Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Continuation of Ser. No. 366,511, Jun. 4, 1973, abandoned. This application Dec. 4, 1979, Ser. No. 100,160
Claims priority, application Japan, Feb. 5, 1973, 48-14960
Int. Cl.³ F16H *3/44*; B60K *41/26*
U.S. Cl. 74—750 B **4 Claims**

1. A speed transmission hub for a bicycle comprising:

a first unit comprising:

a hub shell having a substantially cylindrical interior surface having a first ratchet defined therein at one end thereof and a second ratchet defined therein at the other end thereof, said second ratchet being of smaller maximum diameter than the first ratchet;

means defining a first ball race at the other axial end which is of a diameter less than that of the second ratchet and is axially outward of the second ratchet;

means defining a second ball race at the one end which is of a diameter greater than that of the first ratchet and is axially outward of the first ratchet;

a second unit comprising:

a nonrotatable shaft removably positioned in the center of the hub shell and extending therethrough, said hub shell being rotatably mounted with respect to said shaft;

a driving means rotatably mounted on said shaft, said driving means normally rotatably supporting said second ball race defining means;

a multi-speed transmission mechanism removably housed internally of said hub shell and being rotatable about said shaft, said mechanism comprising a first and second plurality of driving force transmitting pawl members engageable respectively with the first and second ratchets, said first pawl members being the radially outwardly farthest extending component of the mechanism within the hub shell; and

a retaining means for releasably holding said multi-speed transmission mechanism and said driving means in a predetermined axial position on said shaft;

means for releasably securing said second unit to said first unit with the mulit-speed transmission mechanism with the housing; and

said second unit being readily securable to and releasable from said first unit with the multi-speed transmission mechanism being readily movable, as part of the second unit, into and out of the first unit upon release of said holding means without having to remove said first and second ball race defining means.

4,320,673

CONTROL DEVICE FOR AN AUTOMATIC DRIVE OF AN AUTOMOBILE

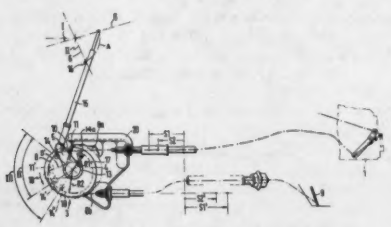
Friedrich Wegert, Ditzingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,927

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855525

Int. Cl.³ B60K *41/04*; G05G *1/14, 1/08*

U.S. Cl. 74—865 **6 Claims**



1. Control device for an automatic drive for an automobile comprising:

a setting device having a rotatable deflector roll with an actuator lever connected to a throttle valve; and

a transmission cable extending from a first end connected with an accelerator pedal over said deflector roll to a second end connected with a slide unit of the automatic drive;

wherein said transmission cable is provided with securing means releasably held in the deflector roll under tensioning of said transmission cable, whereby said securing means is released from said deflector roll upon rupture of said cable and damage to the automatic drive is prevented by said throttle valve being rendered inoperative in response to the accelerator pedal.

4,320,674

SCREW FASTENING APPARATUS

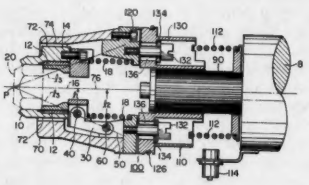
Genji Ito, Funabashi; Mitsunobu Tsunoo, Narashino, and Fumio Fukuchi, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,391

Claims priority, application Japan, Jun. 20, 1979, 54/76754

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—54 **5 Claims**



1. A screw fastening apparatus comprising:

screw-holding means for restricting a screw;

three fingers in all for supporting said screw-holding means from three directions therearound in such a manner as to allow the inclination of said screw-holding means;

finger-holding means for supporting each of said fingers;

engaging means having the center line substantially brought into conformity with that of said screw-holding means and spline-coupled to said screw-holding means with a space required for the inclination of said screw-holding means between them;

a support shaft functioning as the center axis of rotation for both of said finger holding means and said engaging means;

rotation driving means using said support shaft as the output shaft thereof; and

power transmission means for transmitting the rotational torque of said rotation driving means to said engaging means.

4,320,675

MANDREL FOR THE COAXIAL EXTERNAL MACHINING OF WORKPIECES WITH INTERNAL TOOTHING

Rudolf Kohlert, Danzieger Strasse 3, 8751 Stockstadt, and David Fischer, Mainparkstrasse 6096, 8752 Mainaschaff, both of Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 158,030

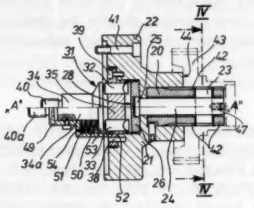
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924802

Int. Cl.³ B23B *25/00, 5/22*

U.S. Cl. 82—43 **33 Claims**

1. In a mandrel for the coaxial external machining of workpieces with internal toothing, the improvement comprising: a reception sleeve with an external toothing corresponding to the workpiece toothing and having openings along the clamping length extending only on a portion of the circumference of

the reception sleeve and wherein the reception sleeve is integral over the entire clamping length; a clamping member disposed with tangential and radial play in the reception sleeve for engaging the workpiece toothing and thereby turnable with respect to the reception sleeve by which the internal toothing of the workpiece can be brought to bear against the



external toothing of the reception sleeve in a circumferential direction, wherein the ends of the clamping member extend through the openings for engaging the workpiece toothing and circumferential parts of the reception sleeve and the ends of the clamping member alternate; and means for turning the clamping between a clamping and an unclamping position.

4,320,676

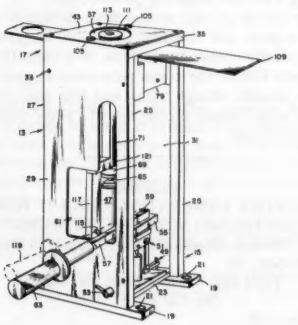
BLANKING PRESS HAVING STRIPPING MEANS

Roland C. Eberhardt, 564 W. 39th St., San Pedro, Calif. 90731

Filed Dec. 26, 1979, Ser. No. 107,361

Int. Cl.³ B21D *45/00*

U.S. Cl. 83—146 **10 Claims**



1. A blanking press, comprising:

a housing having a base portion and an upper work accepting portion;

a die member mounted in said upper portion, said die member including a punch accepting aperture therein;

an elongated ram member having a vertical longitudinal axis axially movably mounted in said housing, said ram including an offset vertically-extending ejection actuation member;

a punch member mounted at the upper end of said ram member; and

linear pressure exerting means mounted in said housing below said ram member and having a vertically movable piston engageable with said ram member for exerting an upward force on said ram and punch members toward said aperture in said die member.

4,320,677

DRIVING SYSTEM

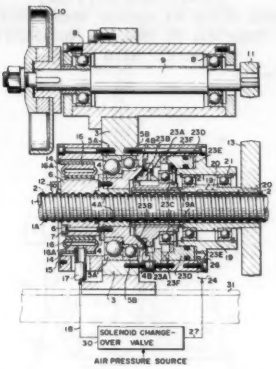
Yoshinori Tahara, No. 101-1, Higashishiiji, Numazu-shi, Shizuoka-ken, Japan

Filed Jul. 30, 1980, Ser. No. 173,729

Claims priority, application Japan, Aug. 7, 1979, 54-100392; Apr. 21, 1980, 55-52758

Int. Cl.³ B23D *19/00*

U.S. Cl. 83—508.2 **5 Claims**



1. A driving system of the type wherein a driving screw shaft is used and one or more units can be selectively moved along the shaft, comprising a driving screw shaft extending through the slide base of a unit to be driven and provided at its periphery with a slide key way extending in the direction of the longitudinal axis of said shaft, a driving source for rotating said screw shaft, a female screw meshed with said screw shaft and provided in the slide base of said unit for rotation with respect to said slide base, a first clutch provided between said slide base and said female screw for coupling and decoupling said slide base and said female screw, a second clutch provided around said screw shaft for rotation together with said screw shaft with respect to said slide base and movable in the direction which said slide key way extends, said second clutch being able to be coupled with and be decoupled from said female screw, and a controller for controlling actuations of said first and second clutches.

4,320,678

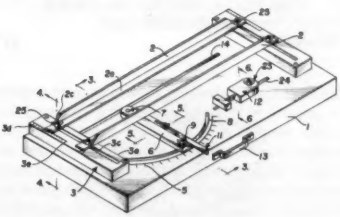
PORTABLE POWER TOOL ACCESSORY TABLE

Michael J. Volk, 216 McKeon Rd., Severna Park, Md. 21146

Filed Mar. 10, 1980, Ser. No. 128,554

Int. Cl.³ B27B *11/04*

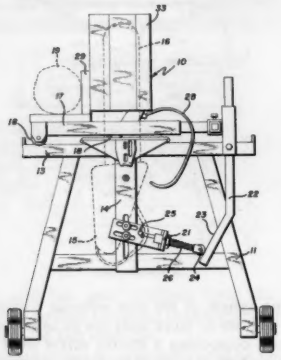
U.S. Cl. 83—574 **6 Claims**



1. A saw table comprising, a table, a saw blade slot provided in said table, saw blade guide means mounted beneath said table in alignment with said saw blade slot, said saw blade guide means comprising a pair of spaced, parallel longitudinally extending flanged members connected beneath said table,

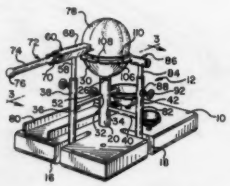
the space between said longitudinally extending flanged members being aligned with the saw table slot, a plate slidably mounted on said flanged members, said plate being operatively connected to the blade of a cutting tool during the cutting of a workpiece on the table to thereby guide and prevent twisting of the blade during the cutting operation.

4,320,679
CHAIN SAW SUPPORT
Roger Trudeau, R.F.D. #1, Spencer, Mass. 01562
Filed May 19, 1980, Ser. No. 150,927
Int. Cl.³ B27B *17/02*
U.S. Cl. 83—574 **6 Claims**



1. Chain saw support, comprising:
(a) a main frame having spaced, parallel tracks,
(b) a mount for fastening a chain saw on the frame with its blade extending vertically in a vertical plane that lies parallel to and externally of the tracks,
(c) a table for supporting a log so that the longitudinal axis of the log is transverse to said vertical plane, said table being slidably mounted on the tracks for carrying a log from a first portion away from the saw to a second position past the saw for making a transverse cut through the log, and
(d) an actuator operated by the sliding movement of the table to accelerate the saw as the table carries the log from the said first position to the second position.

4,320,680
FRUIT CUTTER
Pantaleon S. de la Cruz, 8917 S. 84th Ct., Hickory Hills, Ill. 60457, and Michel A. Chonez, 2838 Scott St., Des Plaines, Ill. 60018
Filed Mar. 3, 1980, Ser. No. 126,835
Int. Cl.³ B26D *3/26*
U.S. Cl. 83—870 **11 Claims**

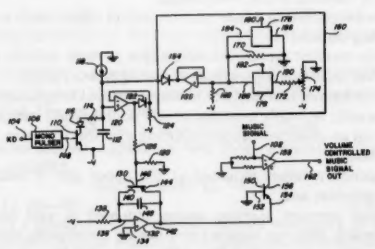


1. An apparatus for cutting a substantially curvilinear object, said apparatus comprising:
(a) a base;
(b) a column carried by said base;
(c) a cup for holding the curvilinear object;
(d) means for supporting the cup on said column whereby said cup is freely rotatable;
(e) a knife for slidable insertion into said curvilinear object; and
(f) means carried by said base for supporting said knife whereby the steps of inserting said knife into said curvilinear object, withdrawing the knife and rotating the cup before a new insertion divides the object in half along a horizontal plane to form two substantially equivalent sections.

4,320,681
ELECTROMAGNETIC PICKUP DEVICE
Michael Altilio, New York, N.Y., assignor to DiMarzio Musical Instrument Pickups, Inc., Staten Island, N.Y.
Filed Feb. 25, 1980, Ser. No. 123,968
Int. Cl.³ G10H *3/00*; H04R *13/02*
U.S. Cl. 84—1.15 **10 Claims**

1. A stringed musical instrument having metallic strings and an electromagnetic pickup device mounted on said musical instrument, comprising:
a planar permanent magnet in said pickup device having first and second parallel opposed main surfaces;
said first main surface having a first magnetic polarity;
said first main surface being disposed facing said metallic strings;
said second main surface facing away from said strings and having a second magnetic polarity; and
means mounted on said second main surface of the permanent magnet and coactive therewith for generating an electromotive force in response to a disturbance of the magnetic field of the planar permanent magnet by motion of the metallic strings facing said first main surface, said means lying entirely on one side of a plane containing said second surface.

4,320,682
ENVELOPE GENERATING CIRCUIT FOR AN ELECTRONIC MUSICAL INSTRUMENT
Wilford R. Schreier, Bensenville, Ill., assignor to Marmon Company, Chicago, Ill.
Filed Jun. 26, 1980, Ser. No. 163,629
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.26 **9 Claims**



1. An envelope generator circuit for use in an electronic musical instrument having means for generating a key down

signal and means for generating music signals, said envelope generator circuit comprising:

circuit means for generating a linearly increasing analog voltage signal in response to said key down signal;

regulator means connected to said circuit means for generating a control signal which is the antilogarithm of said linearly increasing analog voltage signal; and,

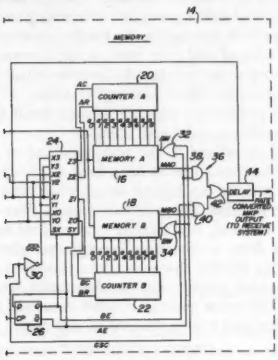
controlled amplifier means receiving said music signals and said control signal from said regulator means for amplifying said music signals by an amplification factor directly proportional to said control signal and for generating volume controlled output music signals which increase equal decibel amounts for equal periods of time.

4,320,683

ASYNCHRONOUS INTERFACE FOR KEYING ELECTRONIC MUSICAL INSTRUMENTS USING MULTIPLEXED NOTE SELECTION

John T. Whitefield, Harleysville, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed Jan. 14, 1980, Ser. No. 111,613
Int. Cl.³ G08C *9/00*; G10F *5/00*
U.S. Cl. 84—115 **22 Claims**



1. Apparatus for keying an electronic musical instrument operable in response to serial multiplexed key pulse information at a first scan rate in accordance with serial multiplexed key pulse information produced asynchronously at a second scan rate which may be the same as or different from the first rate comprising:

at least first and second memories;

means for receiving the multiplexed key pulse information produced at said second rate;

means for alternately storing in each of said memories at said second rate the received multiplexed key pulse information;

means for alternately retrieving from each of said memories at said first rate the multiplexed key pulse information stored therein; and

means for combining the multiplexed key pulse information retrieved from said first and second memories to produce multiplexed key pulse information at said first rate for use in keying the electronic musical instrument.

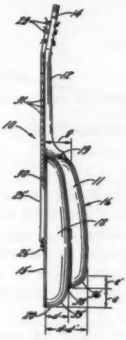
4,320,684

GUITAR CONSTRUCTION

Bozo Podunavac, 2726 University Ave., San Diego, Calif. 92104

Filed Mar. 3, 1980, Ser. No. 126,211
Int. Cl.³ G10D *3/02*
U.S. Cl. 84—291 **4 Claims**

1. An acoustical guitar comprising a hollow body which includes upper and lower bouts interconnected by inwardly curved central side portions, a neck connected at one end to the upper bout of said body and extending outwardly therefrom, a head disposed at the other end of said neck, a plurality of strings disposed along the length of said neck, a bridge mounted on said body for securing one end of said strings, means on said head for securing the opposite ends of said strings in a tensioned condition, said body including a wooden top plate and a one piece plastic molded side and bottom section, said side and bottom section being formed with a pair of lateral sides, a heel end, and a tail end, said lateral sides and tail end being formed with two distinct inwardly directed steps such that the bottom of said side and bottom section is of



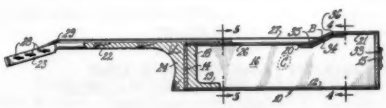
smaller size than said top plate, said steps including a first step of outwardly curved configuration extending inwardly and downwardly from said top plate and a second step of outwardly curved configuration connecting said first step to the bottom of said side and bottom section, said curved steps being connected by a reversely curved connecting portion, said steps each having a depth of about one-half the depth of said bottom section, and said first step extending inwardly a distance about equal to the depth of said first step and said second step extending inwardly a distance of about one-half the depth of said second step.

4,320,685

STRINGED MUSICAL INSTRUMENT

Roger Pytlewski, 7644 Mar Ave., La Jolla, Calif. 92037

Filed Dec. 1, 1980, Ser. No. 211,707
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—291 **7 Claims**



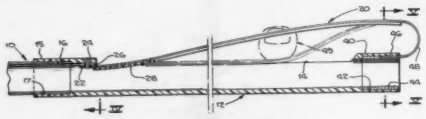
1. A stringed musical instrument such as a guitar, comprising a head, elongated neck and connected walls forming a sound chamber, said chamber including a split-level top surface formed by respective upper and lower panels longitudinally spaced apart and edge-connected to an angular cross bridge, said panels being disposed generally parallel to each other and to a wall forming the bottom of the chamber so as to form a chamber of different depths corresponding to elevations of the split level top,

said elongated neck and lower panel being lengthwise overlaid by tensioned strings extending from said head to said cross bridge and being terminally anchored respectively to the head and to the cross bridge, whereby vibration of a string effects direct vibration of the angular cross bridge,

which vibration is transmitted to and reinforced by the underlying sound chamber.

4,320,686
WIND INSTRUMENT WITH CONTINUOUSLY VARIABLE PITCH CONTROL

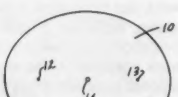
Jeffrey J. Lewis, 710 N. Heliotrope, Los Angeles, Calif. 90019
Continuation of Ser. No. 926,459, Jul. 20, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 106,646
Int. Cl.³ G10D *9/04*
U.S. Cl. 84—380 R **1 Claim**



1. In a wind instrument, the provision of:
mouthpiece means for producing a sound;
tubular means forming an elongated resonating chamber operatively associated at one end with the mouthpiece means, the effective length of the chamber serving to control the pitch of a musical note produced by the instrument;
means selectively actuable by the user for continuously varying the effective length of the chamber including an elongated slot extending substantially the length of the chamber;
closure means digitally operable by the user for closing the slot from its end adjacent to the mouthpiece means to a selected point spaced toward the other end of the slot, said closure means including a longitudinally extending closure strip of flexible sheet material having one end fixed to the tubular means adjacent to the mouthpiece; and
means for resiliently supporting the other end portion of the strip spaced above the outer end of the slot, said supporting means including a segment of said strip adjacent to its distal end and bowed through an arc of 180° with the outermost end of the bowed segment fixed to the outermost end of said tubular means, and the arc of the bowed segment projecting substantially beyond the end of the slot whereby the closure strip can be digitally depressed into slot closing position up to the outermost extent of the slot.

4,320,687
CYMBAL

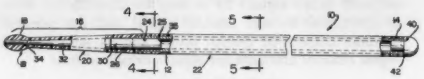
Carl Kidwell, 711 Taylor, Moscow, Id. 83843
Filed Nov. 21, 1980, Ser. No. 208,857
Int. Cl.³ G10D *13/06*
U.S. Cl. 84—402 **6 Claims**



1. A musical instrument adapted to produce a ringing sound when struck, comprising a relatively thin, plate-like body, the periphery of which defines an ellipse.

4,320,688
SYNTHETIC DRUMSTICK AND METHOD OF PRODUCING SAME

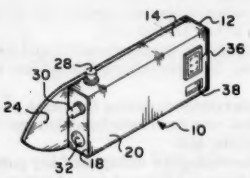
David G. Donohoe, Corona, Calif., assignor to Aquarian Accessories Corporation, Anaheim, Calif.
Filed Dec. 8, 1980, Ser. No. 213,821
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—422 S **5 Claims**



1. A synthetic drumstick defining a striking area and a handle portion, comprising:
a rigid, hollow, tubular core member of a predetermined length forming a part of said handle portion, and having an open front end terminating at the striking area and a rear open end, said front end being formed having an enlarged bore;
a flexible, tapered, solid stud member adapted to be affixed in said open front end of said core, said stud member forming a part of said striking area and comprising an enlarged rear body portion adapted to be fixedly received in said enlarged bore of said core member, an intermediate tapered body portion and a reduced-diameter-dowel-body portion defining a free end of said stud member;
a molded plastic skin member formed about said core and said flexible, tapered stud member;
a striking tip affixed to the rear open end of said core, in order to define a rear striking head and to close said open end to prevent a vibrating sound when struck;
said core member being formed from a fiber-impregnated plastic material, said flexible tapered stud member being formed from a fiberglass-impregnated plastic material, providing flexible characteristics to said stud member, and said molded plastic skin member being formed from a glass-filled nylon material molded about said core and said stud after said stud is secured to said core.

4,320,689
COMBINED PICK AND TUNER

Gary S. Pogoda, 223 N. Douglass Ave., Margate, N.J. 08402
Filed Feb. 11, 1980, Ser. No. 120,061
Int. Cl.³ G10G *7/02*
U.S. Cl. 84—454 **18 Claims**



1. In a stringed musical instrument tuning device the improvement comprising:
a housing, said housing being of sufficiently small size so that it can be conveniently held in a person's hand and being intended to be so held when in use,
a manually operable switch means carried by said housing, said switch means being adapted to control an electronic tuner circuit and being conveniently located so as to be operable while said housing is being held,
a stroboscopic light source carried by said housing and being arranged to illuminate a vibrating string of a stringed musical instrument while said housing is being held, and

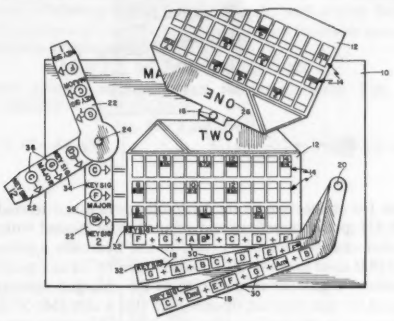
a pick extending outwardly from one end of said housing, the free end of said pick being thin enough to fit between adjacent strings of a stringed musical instrument for plucking the same, said pick and light source being arranged with respect to each other so that the pick can be used to pluck the string to vibrate the same and the vibrating string can then be substantially immediately illuminated by said light source.

4,320,690

MUSICAL STRUCTURAL INTEGRATOR

Verna M. Leonard, 9360 N. Blackstone, Fresno, Calif. 93710

Filed Feb. 21, 1980, Ser. No. 123,194
Int. Cl.[3] G09B *15/02*
U.S. Cl. 84—480 3 Claims



1. A universal music structure integrator comprising:

(a) a frame;

(b) a plurality of overlying scale tone matrices pivoted to said frame to be selectively displayed on said frame each of said matrices comprising a plurality of horizontal rows of spaced indicia vertically registerable with respective individual keys of a piano keyboard and each row displays twelve chromatic scale positions and each matrix represents a single octave and the matrices are numbered to represent consecutive octaves of the keyboard;

(c) a plurality of horizontal arrays selectably positionable beneath the selected scale tone matrix, said horizontal arrays each displaying a diatonic scale in a particular key signature the individual scale tones of which register vertically with the spaced indicia in said rows;

(d) a plurality of vertical arrays on separate panels copivoted to said frame and selectable positionable at one side of said selected matrix, each of said vertical arrays displaying a plurality of named chords related to a key signature corresponding to the scale on a respective one of said horizontal arrays, such that there is a one-to-one relationship between vertical and horizontal arrays, respectively the former displaying chords from the key signature of the scale of the latter, with each of the named chords of said vertical arrays registering with one of the horizontal rows of said matrix; and

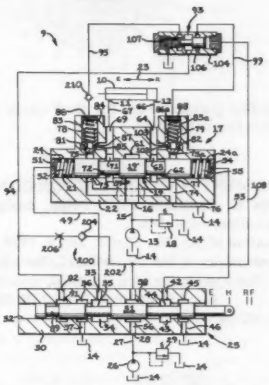
(e) the indicia on each row of each of said matrices indicating which scale tones selected from the scale on the selected underlying horizontal array comprise the chord named in the vertical array registered with the respective row whereby each of said matrices can select any of the key signatures represented by said horizontal arrays and indicate the proper scale tones to be played, in the chords indicated on the respective vertical array.

4,320,691

HYDRAULIC LOAD LIFTING SYSTEM WITH HYDRAULIC SURCHARGE TO MAKE UP VALVE PILOT LINES

Orcenith D. McWilliams, Morris, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00994, § 371 Date Nov. 16, 1979, § 102(e) Date Nov. 16, 1979.
This PCT application filed Nov. 16, 1979, Ser. No. 143,996
Int. Cl.[3] F15B *13/042*
U.S. Cl. 91—437 7 Claims



1. In a hydraulic system (9) having a hydraulic motor (10), a control valve means (17) for controlling the hydraulic motor (10), a make-up valve means (79,83*a*,88) for providing make-up fluid to the load supporting end (12) of the hydraulic motor (10) which make-up valve means (79,83*a*,88) includes an orifice (102) for hydraulically communicating the load supporting end (12) with said make-up valve means (79,83*a*,88) to urge said make-up valve means (79,83*a*,88) closed, vent line means (31,91,92,94,99) for selectively venting the make-up valve means (79,83*a*,88) to allow said make-up valve means (79,83*a*,88) to open, and selector valve means (93) for selectively preventing said vent line means (31,91,92,94,99) from venting the make-up valve means (79,83*a*,88) the improvement comprising means (26,200) for maintaining a predetermined pressure level in said vent line means (91,92,94,99), which includes a one-way valve means (204) for allowing fluid to be introduced into said vent line means (31,91,96,94,99) and a means (26) for providing pressurized hydraulic fluid to said vent line means (31,91,92,94,99).

4,320,692

RADIAL CYLINDER HYDRAULIC MOTOR

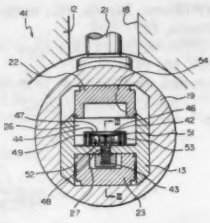
Morio Komiya, Kawasaki, Japan, assignor to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,856
Claims priority, application Japan, Apr. 27, 1979, 54-52229
Int. Cl.[3] F01B *13/06*; F04B *1/30*
U.S. Cl. 91—497 5 Claims

1. A radial cylinder hydraulic motor including a shaft, an annulus integrally rotatable with the shaft, first and second pistons disposed between the shaft and the annulus in diametrically opposed relation, a plurality of pistons circumferentially spaced around the annulus in driving relation therewith and hydraulic control means for selectively applying hydraulic pressure to one of the first and second pistons to urge the same away from the shaft and thereby vary an eccentricity of the annulus relative to the shaft, characterized by comprising:

hydraulically actuated stop means disposed between the shaft and the first piston and being movable between a first

position for abuttingly preventing movement of the first piston toward the shaft closer than a limit distance from the shaft and a second position for allowing movement of



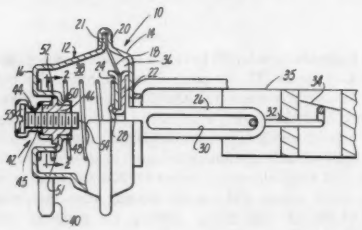
the first piston toward the shaft closer than the limit distance from the shaft.

4,320,693

ADJUSTMENT FOR CARBURETOR CONTROL DEVICES

Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Continuation of Ser. No. 56,079, Jul. 9, 1979, abandoned, which is a continuation of Ser. No. 848,317, Nov. 3, 1977, abandoned.
This application Oct. 23, 1980, Ser. No. 200,560
Int. Cl.³ F01B *31/14;* F15B *15/24*
U.S. Cl. 92—13.6 **3 Claims**



1. A reciprocating vacuum operated servo motor having a housing, a stop member disposed in and extending through a wall of said housing for limiting the stroke of said servo motor, a boss formed on an exterior wall of said housing and forming a threaded opening communicating with the interior of said housing and having an irregular radial outer surface, said stop member being threadably engaged with said boss, a tool receiving portion having an irregular surface formed at one end of said stop member and being disposed at an exterior side of said wall, and a lock member of heat shrinkable plastic material in common sealing engagement with said tool receiving portion and a portion of the threaded portion of said stop member and also with said irregular surface of said boss at an exterior of said housing to obstruct access to said tool receiving portion and prevent fluid leakage and relative axial or rotational movement between said stop member and said boss.

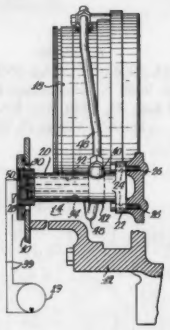
4,320,694

HYDRAULIC MANIFOLD ASSEMBLY

Charles W. Carr, East Moline, Ill., and Kevin G. Forster, Terre Haute, Ind., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 4, 1979, Ser. No. 91,674
Int. Cl.³ F01B *29/00;* F16L *39/00*
U.S. Cl. 92—161 **4 Claims**

1. In an apparatus including a hydraulic appliance (18) within a substantially sealed chamber (14) to be in fluid communication with a hydraulic device 19 exterior of the chamber, a manifold assembly for extending through an enlarged opening (30) in the sealed chamber while sealing the opening and establishing fluid communication between said appliance and said device the improvement comprising: a body (20) having an end face (28) sized to loosely extend through the enlarged opening in the sealed chamber, means (22,24) on the body for securing the body within the sealed chamber in nominally aligned relation with the enlarged opening such that the end face extends therethrough, external threads (50) on the body adjacent said end face extending through the enlarged opening to the exterior of the sealed chamber, at least one fluid conduit (32,34) in the body terminating in a first port (36,38) in said end



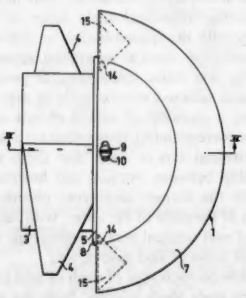
face for connection to the hydraulic device and second port (40,42) spaced therefrom and adapted to be located within the sealed chamber for connection to the hydraulic appliance, a nut (52) sized to cover the enlarged opening for any position of nominal alignment of the body to the enlarged opening disposed on said external threads such that a side (64) of the nut faces and is adapted to cover the enlarged opening and a seal (62) carried by said side of said nut for sealing engagement with the exterior of the chamber about the periphery of the enlarged opening.

4,320,695

AIR DIFFUSER

Lennart Widerby, and Birger Eriksson, both of Jönköping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Filed May 9, 1980, Ser. No. 148,241
Claims priority, application Sweden, May 10, 1979, 7904100
Int. Cl.³ F24F *13/08*
U.S. Cl. 98—40 N **13 Claims**



1. An air diffuser for distributing and feeding out a selected amount of supplied conditioning air, comprising an inlet opening and hood parts connected thereto, said parts being spaced apart to provide an elongated spreading gap in a plane commu-

nicating with said inlet opening, one of said hood parts being displaceable relative to the other for adjustably varying said spreading gap, an adjusting screw to relatively displace said hood parts in a direction perpendicular to the plane of said gap between closed and open limit positions, spring means to keep said hood parts in a position selected by said screw to provide a gap width feeding out said selected amount of air, said screw means including a threaded support which is stationary relative to one of said hood parts, the other of a said hood parts having an adjustment opening receiving the shank of said screw with sufficient clearance for enabling a tilting displacement of said other part substantially at right angles to the adjusting screw to vary the distribution of the selected amount of air along the length of said gap.

4,320,696

AIR OUTLET

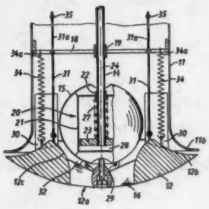
Klaus Daniels, Carusoweg 3a, 8000 Munich 71; Rüdiger Detzer, Mühlweg 78, 6301 Alten Buseck, both of Fed. Rep. of Germany and Josef Brühlmeier, Hintere Hohenstrasse 6, CH54330 Wettingen, Switzerland

Filed Jan. 29, 1979, Ser. No. 7,384

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804670

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—41 AV **19 Claims**



1. An air outlet comprising:

an axially elongated chamber having a housing formed with inlet and outlet ends, said outlet end being formed with a blowing mouth;

an outlet ring disposed in overlying relation over said mouth for shifting axially with respect thereto, the exterior periphery cooperating with said mouth to define a laterally outwardly opening outlet growing progressively larger as said ring is shifted along said axis away from said mouth, said ring being further formed with a central opening;

first mounting means movably mounting said ring from said housing for travel thereof away from and toward said mouth;

a valve body disposed in confronting relationship over said central opening and shiftable along said axis toward and away from said central opening to cooperate therewith in forming a progressively smaller or larger valve opening;

second mounting means movably mounting said valve body from said housing;

pusher means interposed between said ring and valve body and operative in response to a predetermined travel of said body toward said ring to engage said ring and shift it away from said mouth upon continued travel of said body in a direction toward said ring; and

automatic means coupled with said valve body for sequentially shifting said valve body toward said ring to progressively restrict flow between said body and central opening and to then engage said ring and shift said ring progressively away from said mouth.

4,320,697

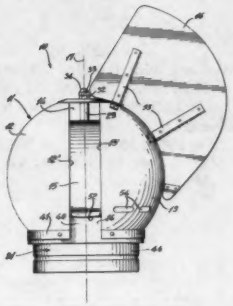
CHIMNEY VENTILATING CAP

J. Guy Smith, Drummondville, Canada, assignor to Venmar, Inc., Germanville, Canada

Filed Jul. 1, 1980, Ser. No. 165,086

Int. Cl.³ F23L *17/10*

U.S. Cl. 98—68 **10 Claims**



1. A chimney ventilating cap for the evacuation of combustion gas from chimneys, said cap comprising a spherical hollow dome body defined by a forward and a rear partly semi-spherical body portion, said front and rear body portions being secured together in a spaced-apart manner to define an opening between their circumferential edge, shield means associated with said opening, wind governor means secured to said rear body portion, said hollow dome body having a vertical pivot connection secured to an open-ended attachment base whereby said dome body is pivotal on said vertical pivot connection to rotate on said base.

4,320,698

TOASTER

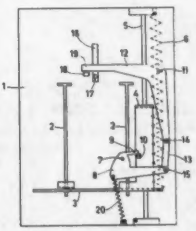
Jan Mugge, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,558

Claims priority, application Netherlands, Jul. 12, 1978, 7807485

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—334 **3 Claims**



1. A toaster comprising a frame; a slice support movable relative to the frame between an unlatched position and a latched position; a first spring tensioned between the slice support and the frame; a first lever pivotally journalled in the frame; a cam on the slice support for engagement with one end of the first lever in the latched position of the slice support for locking the slice support in its latched position, said first lever one end being hook-shaped; a second lever pivotally journalled in the frame; a thermo-sensitive element arranged to exert a force on the second lever to cause pivotal movement thereof; and a toggle arm pivotally coupled at one end to the other end

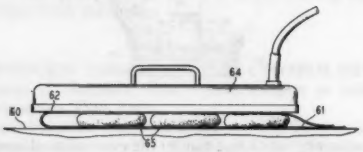
of the first lever and pivotally coupled at its other end to one end of the second lever, said arm being near its toggling position when the first lever locks the slice support in its latched position, and said arm being movable beyond its toggling position by means of the second lever when the thermo-sensitive element exerts said force thereon, whereby the first lever is unlocked and the slice support is returned to its unlatched position by said first spring.

4,320,699

FLEXIBLE SEPARABLE, NON-STICK LINERS FOR HEATED COOKING SURFACES

Chester J. Binks, LaGrange, Ill., assignor to Solar-Kist Corporation, LaGrange, Ill.

Filed Apr. 24, 1978, Ser. No. 899,702
Int. Cl.³ A47J 37/10
U.S. Cl. 99—349 **11 Claims**



1. In combination with a rigid heat transfer cooking surface which in normal use has dry heat applied directly thereto for cooking material lying on said surface:

a flexible liner of thin inert plastic sheet material made of TFE and resting readily separably in covering relation on said cooking surface under the material to be cooked;

said liner being of about 0.001 to 0.003 inch in thickness;

said liner being safe against heat damage to a temperature substantially greater than the maximum cooking heat to which said cooking surface may be expected to be raised while the liner is thereon;

said liner being nonfusible at cooking heat but being heat softenable to conform intimately and in automatic air purging engagement with the heated cooking surface especially under a load of the material to be subjected to cooking heat so that heat is transferred efficiently from said cooking surface through the liner to the cooking material;

and said liner having non-sticking characteristics at least on its surface exposed to the cooking material whereby to avoid sticking of cooking material to said exposed surface and to minimize cleaning efforts.

4,320,700

BARBECUE FORK HOLDER

Edward Stachowicz, Philadelphia, Pa., assignor to BMS Roasting Equipment Corporation, Philadelphia, Pa.

Filed Jul. 10, 1980, Ser. No. 167,575
Int. Cl.³ A47J 37/04
U.S. Cl. 99—421 HV **9 Claims**

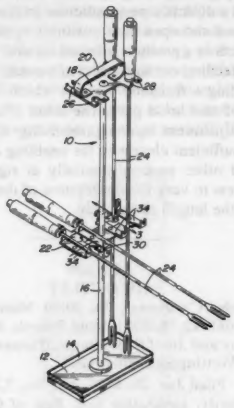
1. An apparatus for supporting one or more long-shafted forks in a first vertical position for storage and in a second operative position whereby the forks may be used to hold food over an open heat source, comprising:

(a) a base having dimensions sufficient to provide vertical stability;

(b) a stand post mounted vertically to the base and having a length greater than the shaft of a fork to be supported thereon;

(c) an upper bracket attached to said post and adapted to hold the forks in a first vertical position; and

(d) a lower bracket attached to said post at an elevation below said upper bracket and adapted to hold the forks in said second position, said lower bracket including a cross bracket to which there are pivotably attached two or more fork supporting brackets for holding the forks in a substantially horizontal position.

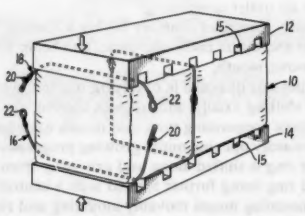


4,320,701

COMPOSITE BALE TIE METHOD

Harris M. Donaldson, 463 Los Pajaros Ct., Los Altos, Calif. 94022

Filed Mar. 21, 1980, Ser. No. 131,948
Int. Cl.³ B65B 13/02
U.S. Cl. 100—3 **1 Claim**

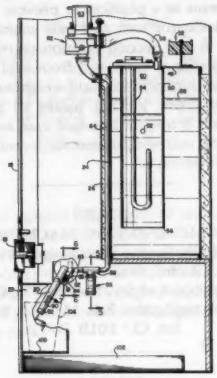


1. In the method of handling cotton and wool and the like which comprises the steps of tying a large bale at a gin with a plurality of long wire ties having at their ends complemental fastening means, untying the bale at a compress, compressing the bale to a smaller size, and tying the smaller bale with a plurality of short wire ties having at their ends complemental fastening means, the improvement comprising the steps of making up said long ties by connecting together first and second ties having at their ends complemental fastening means, said first tie corresponding in length to one of said short ties and said second tie having a length corresponding to the circumferential difference between said large bale and said smaller bale, disconnecting the first and second ties at the compress and maintaining them intact for further use, connecting the first tie about one of said smaller bales, and returning the second tie to the gin for re-use in the make-up of said long ties.

4,320,702
STEAM GENERATOR

Kyaw J. Shein, Fullerton, Calif., and Raymond J. Neely, Lansdale, Pa., assignors to Refreshment Machinery Incorporated, Warminster, Pa.

Filed Mar. 20, 1980, Ser. No. 132,204
Int. Cl.³ F22B 5/00
U.S. Cl. 122—13 A 10 Claims

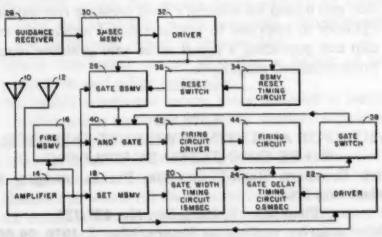


1. A low-pressurized steam generator comprising a tank adapted to contain a supply of water, a primary heater in the tank for heating water, an enclosure in said tank and disposed in an upright position, the capacity of the enclosure being substantially less than the capacity of the tank, the upper end of the enclosure being sealed to a horizontal wall member above water level in the tank, the lower end of said enclosure being in open communication with said tank, an auxiliary heater disposed within said enclosure for converting hot water into steam, a conduit means containing a valve, one end of said conduit means communicating with the upper end of said enclosure above water level therein, a steam discharge nozzle connected to the other end of said conduit means, and a suction breaker connected to said conduit means between the locations of said valve and nozzle.

4,320,703
TARGET DETECTING DEVICE

Erwin I. Abadie; Kenneth A. Lawlor, and John O. Dick, all of Riverside, Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1966, Ser. No. 553,344
Int. Cl.³ F42C 13/04
U.S. Cl. 102—214 6 Claims



1. In a target detecting device of the passive type for use in a guided missile the combination comprising:

(a) signal receiving means for receiving signals from radiating targets for producing negative and positive output pulses,

(b) missile guidance circuit means for receiving signals from radiating targets and producing output signals representing the pulse repetition rate of the target radar of interest.

(c) an "and" gate circuit having a plurality of inputs and an output,

(d) first gate signal generating means coupled to said signal receiving means and to one of the inputs of said "and" gate for generating a first gate signal in response to received negative pulses,

(e) second gate signal generating means coupled to said signal receiving means and to one of the inputs of said "and" gate for generating a second gate signal in response to received positive pulses,

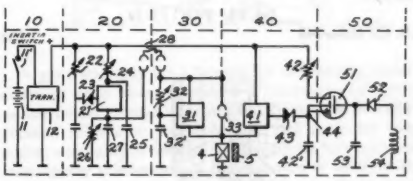
(f) third gate signal generating means coupled to said missile guidance circuit and to one of the inputs of said "and" gate for generating a gate signal in response to the guidance signal representing the pulse repetition rate of the target radar of interest,

(g) firing circuit means coupled to the output of said "and" gate and being responsive to an output signal from said "and" gate when all three gate signals are simultaneously present to initiate a firing signal.

4,320,704
ELECTRONIC PROJECTILE FUSE

Heinz Gawlick, Furth; Uwe Brede, Schwaig, and Hellmut Bendler, Erlangen-Spardorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 262,930, Jun. 9, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 494,200
Int. Cl.³ F42C 11/06, 9/16
U.S. Cl. 102—218 8 Claims



1. Electronic fuse for projectiles having a switch, a detonator and an explosive charge, said fuse comprising a source of electrical energy, means responsive to discharge of the projectile to render said energy source operative, a control mechanism for preventing muzzle burst, an adjustable mechanism for determining the time delay of explosion and a programmable self-destruct mechanism, all said mechanisms being connected to said energy source, said mechanisms being provided with control elements and formed as self-contained units, the control mechanism including an electronic integrated circuit having an anode-cathode connection with a thyristor in the anode-cathode connection and a trigger diode.

4,320,705
SAFETY DEVICE FOR A PYROTECHNIC ASSEMBLY

Maurice R. Petiteau, Besancon, France, assignor to Societe Anonyme Sormel, Besancon, France

Filed Mar. 6, 1980, Ser. No. 127,834
Claims priority, application France, Mar. 19, 1979, 79 06883
Int. Cl.³ F42C 15/26
U.S. Cl. 102—232 10 Claims

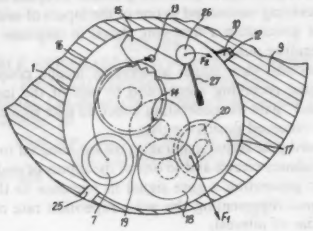
1. A safety device for the pyrotechnic assembly of a spinning projectile provided with an explosive charge comprising:

a mobile member adapted to be housed in a recess in said projectile, said mobile member being movable within said recess between a first position in which ignition of said

explosive charge is prevented and a second position in which ignition is possible;

a clockwork mechanism including a pivoting regulator;

a disengagement lever controlled by said clockwork mechanism for locking said mobile member in said first position and releasing said member for movement to said second position;



said clockwork mechanism and said disengagement lever being fixed to and movable with said mobile member,

the pivotal axis of said pivoting regulator being coincident with the axis of rotation of said projectile while said mobile member is in said first position.

4,320,706

PERCUSSION HEAD FUSE FOR AN EXPLOSIVE PROJECTILE

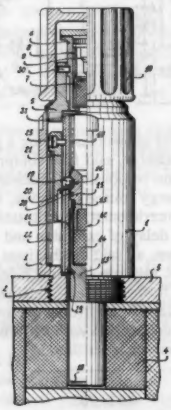
Maurice Rusbach, Nyon, Switzerland, assignor to Sarmac S.A., Geneva, Switzerland

Filed Oct. 16, 1979, Ser. No. 85,287

Claims priority, application Switzerland, Dec. 22, 1978, 13088/78

Int. Cl.³ F42C *15/24*

U.S. Cl. 102—249 **7 Claims**



1. A percussion head fuse for an explosive projectile, comprising a cylindrical body, fixing means on the rear end of the cylindrical body to attach the cylindrical body to the forward end of a projectile containing an explosive charge, a case member extending axially beyond said body and being adapted to be disposed in the operating position within said explosive charge of the projectile, a detonator comprising casing means having a rearward portion which is closed and reinforced and serves as armor plating, a casing disposed coaxially within said cylindrical body, means releasably locking said casing means within said casing in a position in which said detonator is forward of said case member and said reinforced armor plating shields said explosive charge from said detonator, means yieldably urging said detonator toward an armed position within said case member, and means for releasing said releasable locking means, said releasing means comprising an inertia weight member slidably mounted in said cylindrical body for successive movement between first, second and third positions, said weight member in said first and second positions retaining said locking means in a position to prevent rearward movement of said detonator into said case member, said weight means moving to said second position rearwardly by inertia when said projectile is fired and from said second position forwardly to said third position, said weight means in said third position releasing said locking means to permit rearward movement of said detonator into said case member, and resilient means urging said weight member forwardly toward said first and third positions.

4,320,707

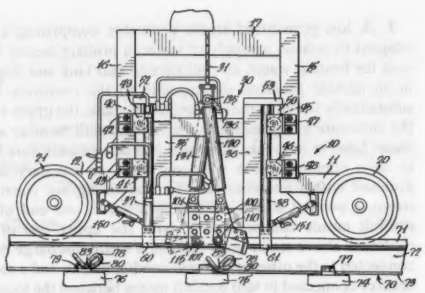
CLIP-APPLYING MACHINE

William P. McIlrath, Racine, Wis., assignor to Racine Railroad Products, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 951,576, Oct. 16, 1978, abandoned. This application Feb. 14, 1980, Ser. No. 121,594

Int. Cl.³ E01B *29/32*

U.S. Cl. 104—1 R **10 Claims**



1. A machine for applying a clip to a tie alongside a rail and detecting when said clip is fully seated comprising:

a pair of arms pivotally mounted for rotation in a plane which extends parallel to said rail, means on one of said arms for engaging and advancing said clip to a fully seated position, and means associated with the other of said arms for engagement by said clip for detecting the fully-seated clip position, said detecting means including hydraulic circuit means having a hydraulic cylinder connected to said other arm, means for isolating fluid within said cylinder, and means for sensing a fluid pressure rise within said cylinder in response to predetermined movement of said clip and providing a signal when said pressure reaches a predetermined magnitude.

4,320,708

DEVICES FOR ADJUSTING TWO BUTT ENDS OF RAILS TO BE CONNECTED BY WELDING

Patrick Bommart, Rueil-Malmaison, France, assignor to C. Delachaux, France

Filed Mar. 5, 1980, Ser. No. 127,327

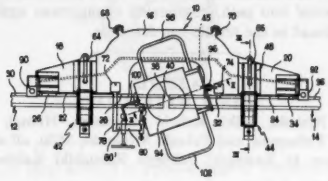
Claims priority, application France, Mar. 5, 1979, 79 05621

Int. Cl.³ E01B *29/46*

U.S. Cl. 104—112 **10 Claims**

1. An apparatus for the adjustment of two butt ends of rails to be connected by welding, comprising a rigid structure having first and second support plates which are aligned and

inter-connected by a concave part, said rigid structure being horizontally disposed with said first support plate being pressed against one vertical side of the head of one of the rails and with the second support plate being pressed against the corresponding vertical side of the head of the other rail, a region for access being defined around the butt ends by said concave part, said rigid structure including a retaining clamp



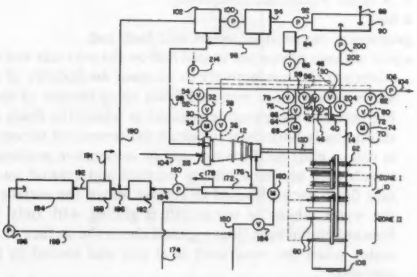
mounted on each support plate, each of said retaining clamps having a movable jaw to bear against the opposite vertical side of the head of the appropriate rail, and said rigid structure having two supports integral with each of said first and second support plates, said supports being spaced apart in order to form four spaced supports constituting a reference line for the alignment of the rails.

4,320,709

HAZARDOUS MATERIALS INCINERATION SYSTEM

Kenneth W. Hladun, Narberth, Pa., assignor to Pyro-Sciences, Inc., Mt. Laurel, N.J.

Filed Sep. 29, 1980, Ser. No. 191,950
Int. Cl.³ F23G *3/00*
U.S. Cl. 110—235 20 Claims



1. In an industrial incineration system, the combination of

a solids combustor means including a solids waste inlet and a flue gas outlet,

the solids combustor means being adapted to incinerate solid and semi-solid waste materials primarily without the addition of liquid of gaseous fuel;

a liquids combustor means including a burner, a liquids waste inlet and a flue gas outlet,

the liquids combustor means being adapted to incinerate liquid waste materials primarily without supplemental fuels at elevated temperatures;

an afterburner means including a combustion chamber having an outlet, a first breeching inlet to the combustion chamber to which the flue gas outlet of the solids combustor means is connected and a second breeching inlet to the combustion chamber to which the flue gas outlet of liquid combustor means is connected,

the first breeching inlet being adapted to direct products of combustion gases of the solids combustor means into the combustion chamber,

the second breeching inlet being adapted to direct products of combustion gases of the liquids combustor means into the combustion chamber,

fuel burning means positioned in the afterburner combustion chamber to elevate and maintain elevated temperatures within the combustion chamber;

air pollution control system means receiving products of combustion gases from the combustion chamber outlet to clean the gases,

the air pollution control system means comprising at least a gas conditioning unit, a high temperature baghouse and a gas scrubber;

means to introduce an adequate supply of oxygen to the liquids combustor means, to the solids combustor means and to the afterburner means for combustion purposes; and

means to maintain an excess of oxygen over demand in the afterburner means under all conditions of load in the solids combustor means.

4,320,710

GRATE MECHANISM FOR INCINERATING FURNACES

Hansruedi Steiner, Wettingen, and Arnold Erbsland, Geroldswil, both of Switzerland, assignors to Widmer & Ernst AG, Wettingen, Switzerland

Filed Mar. 12, 1980, Ser. No. 129,624
Claims priority, application Switzerland, Mar. 14, 1979, 2416/79
Int. Cl.³ F23N *7/08*
U.S. Cl. 110—281 7 Claims

1. A grate assembly for a furnace for incinerating material comprising: grate means composed of stationary and moving grate bar means arranged in rows and inclined at an angle of inclination relative to the horizontal, said grate bar means including a plurality of obliquely inclined grate bars juxtaposed in overlapping relationship in the direction of material flow through said furnace; means defining a combustion zone beneath said grate means; a torsion shaft having said moving grate bar means attached thereto and extending from beneath said grate means within said combustion zone to the exterior of said combustion zone; drive means located on the exterior of said combustion zone for actuating said moving grate bar means through said torsion shaft; a lever system including swivel lever means interposed between said drive means and said torsion shaft on the exterior of said combustion zone; and slide guide attachment means interposed with said lever system between said drive means and said torsion shaft on the exterior of said combustion zone; said drive means operating through coordination of said torsion shaft, said swivel lever means and said slide guide attachment means to impart to said moving grate bar means an approximately linear movement in the direction of inclination of said moving grate bar means.

4,320,711

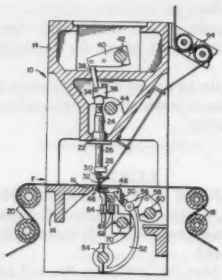
TUFTING APPARATUS FOR FORMING LOOP AND CUT PILE

Ian Slattery, Hixson, Tenn., and Wheeler E. Phillips, Kensington, Ga., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed May 26, 1981, Ser. No. 266,962
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R 5 Claims

1. In a tufting machine, means for feeding a base material in

one direction, first and second yarn-carrying needles for penetrating the base material and forming loops therein, means for feeding yarn to each of said needles, a hook disposed on the opposite side of the base material from said needles including a blade and a loop seizing free end facing in the direction opposite to the direction of material feed, means for mounting said hook for oscillatory movement toward and away from cooperation with said first needle so that said hook enters successive loops presented by said first needle, means for oscillating said knife into cooperation with the blade of said hook for severing



loops thereon to form cut pile, a looper disposed on the opposite side of said base material from said needles including a loop seizing free end facing in the direction opposite to the direction of material feed, means for mounting said looper for oscillatory movement toward and away from cooperation with said second needle so that said looper enters successive loops presented by said second needle, a wiper, and means for oscillating said wiper into cooperation with the free end of said looper for pushing each loop seized by said looper off the free end thereof.

4,320,712

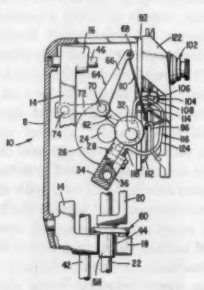
THREAD HANDLING

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 18, 1979, Ser. No. 49,680

Int. Cl.[3] D05B *1/12, 49/00*

U.S. Cl. 112—184 **9 Claims**



1. In a lockstitch sewing machine having an armshaft driving an eye pointed needle carrying needle bar through a needle bar drive link pivotally connected at one end portion with the needle bar and at the other end portion with an orbiting crank pin carried by a counterbalanced crank rotated by the arm shaft, a take-up lever comprising a needle thread take-up operated by the counterbalanced crank and a rotary loop taker driven at a three-to-one rotational ratio relative the arm shaft and operatively associated with the needle for cooperation therewith to concatenate a series of type 301 lockstitches about a needle thread carried by the eye pointed needle, means operatively associated with the needle bar drive link for controlling needle thread slack only during descent of the needle thread take-up taking up thread prior to needle penetration to prevent slack needle thread from being wound about the needle point and for metering said needle thread slack back out to the needle following needle penetration to provide slack for loop formation and comprising a controlling and metering cam carried by said needle bar drive link to be projected by movement thereof into path lengthening engagement against said needle thread as the needle bar descends.

4,320,713

SMALL WATERCRAFT

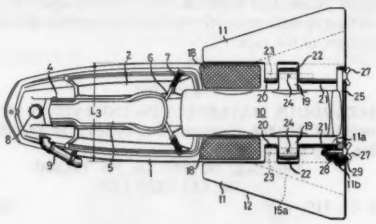
Hiroshi Nishida, Miki; Keiichi Nakamizo, Himeji; Takemi Inoue, Kakogawa, and Takeshi Miyazaki, Miki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 8, 1980, Ser. No. 147,987

Claims priority, application Japan, May 16, 1979, 54-60965

Int. Cl.[3] B63B *43/14*

U.S. Cl. 114—123 **9 Claims**



1. A small watercraft comprising:

a hull;

propulsion means mounted on said hull; and

a pair of floats connected to said hull on the port side and the starboard side respectively to increase the stability of the watercraft when at rest, said floats being capable of moving between an operative position in which the floats are substantially horizontal to permit the watercraft to remain at rest or glide on the water and an inoperative position in which they are substantially vertical and stowed away; said floats each disposed to remain above the surface of the water when the watercraft is gliding with only the forward end of each float exposed above the surface of the water when the watercraft is at rest and loaded to full capacity,

said floats each substantially triangular in planar configuration, diverging in the direction of the stern,

said floats each having an inclined undersurface of substantially uniform width extending obliquely downwardly from the outer edge portion thereof.

4,320,714

HEAT FIXING DEVICE

Shigeru Shimazaki; Yasuhiro Uehara, and Hiroo Nishide, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,733

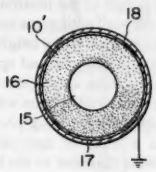
Claims priority, application Japan, Jun. 12, 1980, 54/73002

Int. Cl.[3] F27B *9/28;* B05C *21/00*

U.S. Cl. 118—60 **4 Claims**

1. In a heat fixing device of the type wherein a sheet to be fixed with an image on one surface thereof is passed over the surface of a fixing roll having a heat source on the interior thereof, and said one surface of said sheet is pressed against said fixing roll by an elastic pressure roll so that a toner image is heated and fixed to said one surface of said sheet, the improvement characterized in that said pressure roll comprises:

a steel core;
an inner elastic layer surrounding said core;
a grounded electroconductive metal layer surrounding said inner elastic layer; and



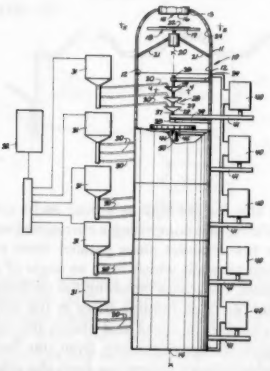
an outer layer formed of a non-adhesive, non-stick insulating material selected from the group consisting of tetrafluoroethlyene or HTV silicone rubber or RTV silicone rubber.

4,320,715

PARTICLEBOARD FURNISH BLENDER

Thomas M. Maloney, and E. Max Huffaker, both of Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed May 27, 1980, Ser. No. 153,274
Int. Cl.³ A01C *1/08*
U.S. Cl. 118—303 **5 Claims**



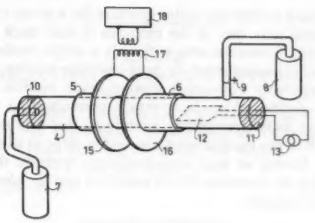
1. A particleboard furnish blending apparatus for applying liquid adhesive to wood particles, comprising:
a hollow housing having continuous cylindrical walls centered along a vertical axis and leading to an open bottom end;
the housing including a hemispherical upper end centered about the vertical axis and smoothly merging into the cylindrical walls to form an annular downwardly flared inner housing surface;
an infeed opening centered about the vertical axis at the hemispherical upper end;
furnish distribution means located within the hemispherical upper end of the housing directly beneath said infeed opening for receiving loose furnish and for forming the loose furnish into a free fall continuous concentric shell of loose particles adjacent to the housing cylindrical walls;
the furnish distribution means including a horizontal disk coaxially mounted about the vertical axis and having a frictional upper surface for throwing furnish radially outward toward the annular downwardly flared inner housing surface;
means for rotating the disk about the vertical axis;
a plurality of inverted conical adhesive atomizers, each atomizer having an upwardly facing cupped surface with a circular peripheral edge centered about the vertical axis;
the atomizers being arranged coaxially within the housing along the vertical axis for producing atomized spray bands of liquid adhesive directed outwardly against the shell of loose particles;
means for supplying liquid adhesive to the cupped atomizer surfaces;
means for rotating the atomizers about the vertical axis; and
means for agitating the particles within the shell of loose particles after they drop past one atomizer and before being exposed to the next atomizer as the particles fall through the housing toward its open bottom end.

4,320,716

ULTRA-HIGH FREQUENCY DEVICE FOR DEPOSITING THIN FILMS ON SOLIDS

Philippe Boulanger; Daniel Kaplan, and Georges Mourier, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 16, 1980, Ser. No. 150,436
Claims priority, application France, May 18, 1979, 79 12712
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—723 **10 Claims**



1. An ultra-high frequency device for depositing thin films on solids, wherein it comprises an elongated enclosure, means for exciting an ultra-high frequency electromagnetic field created in a limited zone of the enclosure, a vacuum pump, means for injecting into the said enclosure a gaseous compound able to release the particles to be deposited after decomposition, whereby the vacuum pump and the injection means having connections positioned on the enclosure on either side of the high frequency excitation zone, the injection flow rate of the gaseous compound and the pressure in the enclosure being such that most of the gaseous compound is decomposed in an area between the injection connection and the excitation zone, the material on which the deposit is to be made being placed in the enclosure in said gas decomposition zone.

4,320,717

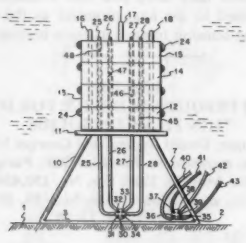
SEA LIFE HABITAT APPARATUS

Paul R. Rowley, Goleta, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 2, 1981, Ser. No. 250,345
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **5 Claims**

1. An apparatus for growing sea life in a plurality of upwardly stacked individual habitat modules comprising a base means adapted to rest on the sea floor, said base means carrying a support means for receiving and supporting the lowermost module in said stack of modules, guide means carried by said base and/or support means for aligning said modules into said stacked configuration and for guiding said modules toward said support means as each module is lowered through the water, at least two enclosed habitat modules for holding said sea life, each module having at least one upstanding side closed by a top and bottom to define a closed chamber for holding said sea life, at least two riser means carried by said

base and/or support means, there being one riser for each module in said stack of modules, each module having a plurality of enclosed feed compartments therein which extend through the height of said module from top to bottom, the number of said compartments in each module corresponding to the number of said risers, each said compartment being sized to allow a riser to pass therethrough and having seal means at its top and bottom openings for sealing around the periphery of said riser, each riser having an outlet aperture, the outlet apertures on said risers being staggered along the height of said



module stack so that the outlet aperture for a given riser corresponds with only one of the modules in said stack and each riser thereby communicates with only a single module in said stack, each compartment in each module having an outlet conduit operably connected thereto, each module carries a manifold means which is operably connected to all outlet conduits in its corresponding module so that said manifold is open to all of the compartments in said module at all times, said manifold having at least one discharge aperture therein for discharging the contents of said manifold into the closed chamber of said module.

4,320,718

RUBBER TEAT HOLDER

Tilmann Hoefelmayr, Niederteufen, Switzerland, and Jakob Maier, Türkheim, Fed. Rep. of Germany, assignors to Biomelktechnik Swiss Hoefelmayr & Co., Niederteufen, Switzerland

Filed Oct. 8, 1980, Ser. No. 195,262

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941150

Int. Cl.³ A01J *5/06*

U.S. Cl. 119—14.47 **16 Claims**

1. A rubber teat holder having a head portion which is rotationally symmetrical with respect to a longitudinal axis and has an inlet opening for the teat, and a holding edge for gripping over a milking cup sleeve, the head portion being formed by a wall which encloses the inside thereof, the wall being constructed such that it first gradually enlarges radially from said inlet opening in a direction along the longitudinal axis and then tapers back into a flexible suction sleeve which is connected to the head portion and is slightly conical or substantially cylindrical, whereby upon application of an axial force on the edge of the inlet opening the upper enlarging part of the head portion, which part adjoins the inlet opening and forms a flexible lip, can be moved against the lower tapering part of the head portion around a part of the head portion, which part acts as a first spring joint, wherein the improvement is comprised in that the first spring joint is formed by the wall portion which lies approximately at the height of the maximum outside diameter of the head portion, the wall acting as a second spring joint in the lower tapering head portion at the height of a cross plane perpendicular to the longitudinal axis and spaced below said first spring joint in response to an axial pressure onto the inlet opening of the teat holder, the wall portion which lies between the first and the second spring joint being pivotable about said second spring joint like a lever of approximately constant length to enlarge the outside diameter of the head portion, the connecting line which as viewed in axial cross section connects the first and second spring joints defining an angle not greater than 45° with the cross plane, and the mean diameter of the tapering head portion being smaller at the level of the second spring joint than the largest inside diameter of the milking cup sleeve.

4,320,719

BUILDING UNIT FOR PIGGERIES

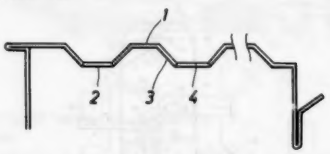
Sven O. Clemmesen, Plantagevej 20, DK-2820 Gentofte, Denmark

Filed Mar. 10, 1980, Ser. No. 128,547

Claims priority, application Denmark, Aug. 31, 1979, 3670/79

Int. Cl.³ A01K *1/00*; E04C *2/42*

U.S. Cl. 119—28 **5 Claims**



1. A building unit for use both as a floor and a ceiling in a piggery, said building unit comprising a corrugated metal plate having a profile that includes plane parallel wave crests and troughs connected by walls which form an angle of about 45° with the two planes, the planes including flat surfaces forming the crests and flat surfaces forming bases in the troughs, the plate including openings in one of said planes, the unit further including a straight flange depending from one lateral edge thereof and a folded flange depending from the other lateral edge thereof, the flanges arranged for interlocking like adjacent building units when forming an assembly of the units.

4,320,720

GEOTHERMAL LIVESTOCK WATERER

Clifford P. Streed, R.R. 2, Mt. Vernon, Iowa 52314

Filed Feb. 7, 1980, Ser. No. 119,258

Int. Cl.³ A01K *7/00*

U.S. Cl. 119—73 **4 Claims**

1. The method of delivering heat to an open animal watering device, including the steps of

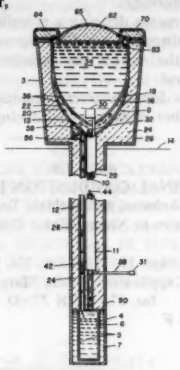
the transfer of heat from below the surface of the earth by the geothermally induced evaporation of a working fluid in a reservoir within the earth,

the transfer of vaporized working fluid to a chamber adjacent a container for water above the surface of the earth,

the condensation into liquid form of the working fluid in said chamber,

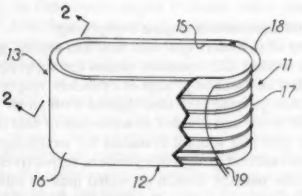
the transfer of heat released in said condensation process to the water in the above ground container by conduction

through a common wall between said chamber and said water container,



the transfer of condensed working fluid from the chamber to the reservoir.

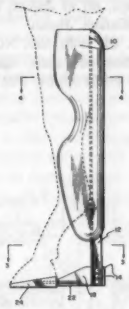
4,320,721
ANIMAL WATERING APPARATUS
Wayne E. Silcox, Shepherd, Mont. 59079
Filed Mar. 28, 1980, Ser. No. 135,206
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—73 **8 Claims**



1. An animal watering apparatus including a substantially vertical sidewall portion and a substantially flat end portion forming an open-ended unitary structure, said sidewall portion including an inner wall section and an outer wall section spaced therefrom and substantially parallel thereto, electrical heating means disposed between said inner wall section and said outer wall section, said electrical heating means including spaced electrical resistance wiring disposed around the perimeter of said inner wall section and in direct contact therewith along substantially its entire length, insulating material extending from the outwardly facing portions of said wiring and the portions of said inner wall section between said wiring to said outer wall section, said electrical wiring and said insulating material being confined to said sidewall portion, and means for connecting said heating means to an electrical power source.

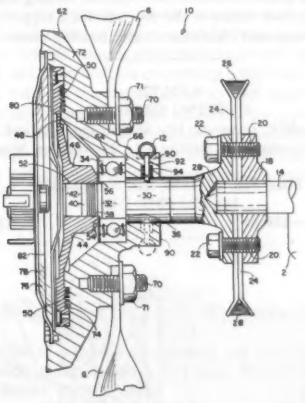
4,320,722
LIVESTOCK SPLINT
Stephen M. Glassman; James D. Kice, and Paul A. Ryding, all of Wichita, Kans., assignors to KRG, Inc., Wichita, Kans.
Filed May 12, 1980, Ser. No. 149,269
Int. Cl.³ A61F *5/04*; A01K *29/00*
U.S. Cl. 119—96 **12 Claims**

6. An animal leg brace or splint which fits behind the leg of the animal comprising: a shell member having a back and for partially encasing the leg of the animal; a truss support means generally traversely embedded in and across the entire back of said shell for supporting the shell as it partially surrounds the leg of the animal; a plate means adjustably attached to said truss support means and extending substantially perpendicular thereto; a core means integrally bound to said plate means; and



a toe wedge means for supporting the hoof of the animal and having a structural portion of said core means embedded therein.

4,320,723
SELECTIVELY OPERABLE FAN DRIVE ARRANGEMENT
Vincent F. Wendling, 7533 Mt. Hood Blvd., and Frank K. Mattson, 7575 Mt. Hood Blvd., both of Dayton, Ohio 45424
Filed Jun. 11, 1979, Ser. No. 47,087
Int. Cl.³ F01P *7/02*
U.S. Cl. 123—41.12 **14 Claims**



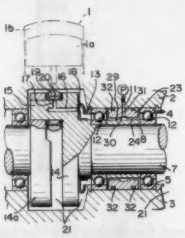
2. A fan clutch lock for temporarily forcing a cooling fan fluid clutch associated with an internal combustion engine to turn without slippage, comprising a shaft member adapted to be driven in rotation, mounting means for mounting a fan to be turned by said shaft member, said mounting means including a fluid clutch arranged normally to permit a controlled amount of fan slippage as generally regulated by the engine operating temperature, with more fan slippage occurring at higher engine operating speeds, and selectively applied locking means within a portion of said mounting means, and adjacent said shaft member, and on occasion extending into locking relationship with said shaft member, for circumventing the fan fluid clutch such that on engagement of said locking means, the fan rotates at the same speed as said shaft member at all engine operating speeds.

4,320,724

INTER-CRANKCHAMBER SEALING MEANS FOR MULTIPLE CYLINDER TWO STROKE ENGINES

Toshiyuki Takada, Miki; Shinichi Tamba, Kakogawa, and Hitoshi Yamamoto, Hyogo, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 14, 1980, Ser. No. 140,008
Claims priority, application Japan, Apr. 16, 1979, 54-46993
Int. Cl.³ F02B *33/04;* F01M *1/00*
U.S. Cl. 123—73 AD 5 Claims



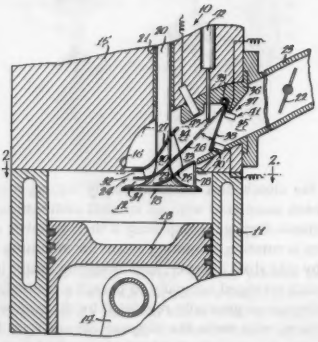
1. Crankchamber precompression type multiple cylinder two stroke engines comprising at least two crankchambers which is defined by crankcase means and in which intake gas in introduced and compressed so as to be forced into combustion chambers, rotatable shaft means extending between the crankchambers and supported by bearing means on the crankcase means, sealing means encircling said rotatable shaft means with a clearance therebetween, said sealing means being formed with liquid passage means leading from liquid supply source and opening to said clearance between the sealing means and the rotatable shaft means to thereby provide a supply of lubricant oil through said clearance to said bearing means.

4,320,725

PUFFING SWIRLER

Frank J. Rychlik, deceased, late of Chicago, Ill., and Alan F. Rychlik, executor, 4 Hilltop Ct., Hawthorne Woods, Ill. 60141

Filed Feb. 25, 1980, Ser. No. 124,580
Int. Cl.³ F01L *3/06*
U.S. Cl. 123—188 M 22 Claims



1. In an internal combustion engine having means defining a cylinder defining an inlet port and an outlet port, a piston disposed in said cylinder for reciprocation between a top position adjacent the inlet port and a bottom position spaced therefrom, means for supplying a combustible fluid comprising a mixture of air and vaporized fuel to said inlet port, and a valve movably positionable for selectively closing said inlet port, the improvement comprising:

flow directing means defining a plurality of swirl-inducing passages for directing said fluid through said inlet port to swirl about the axis of the cylinder during the piston movement; and

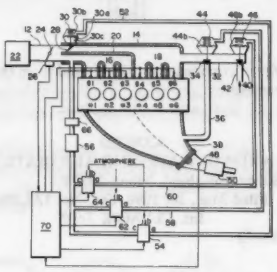
selecting means for selectively directing the fluid into a selected number of said swirl-inducing passages.

4,320,726

INTERNAL COMBUSTION ENGINE

Yukihiro Etoh, Yokohama, and Toshiaki Tanaka, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 13, 1980, Ser. No. 130,067
Claims priority, application Japan, Mar. 16, 1979, 54-30729
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—198 F 6 Claims



1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) first and second fuel injection means for supplying fuel into said first and second groups of cylinders, respectively;

(c) an air intake passage provided therein with an air metering throttle valve and divided downstream of said throttle valve into first and second branches for supplying air to said first and second groups of cylinders, respectively, said second intake passage branch provided near its inlet with a stop valve normally open to allow the flow of air into said second group of cylinders;

(d) an exhaust passage through which exhaust gases are discharged from said cylinders to the atmosphere;

(e) an EGR passage having its one end opening into said exhaust passage and the other end opening into said second intake passage branch, said EGR passage having therein an EGR valve normally closed to interrupt recirculation of exhaust gases into said second intake passage branch;

(f) an air introduction passage having its one end connected to an air source and the other end opening into said second intake passage branch, said air introduction passage having therein an air valve normally closed to interrupt the flow of air thereinto;

(g) an air/fuel ratio sensor for monitoring the air/fuel ratio at which said engine is operating;

(h) signal generating means for providing, in synchronism with rotation of said engine, a fuel injection signal to said first and second fuel injection means, said signal generating means adapted to operate normally in a first mode to determine the pulse width of the fuel injection signal in response to engine load and said air/fuel ratio sensor and in a second mode to determine the same independently of the output of said air/fuel ratio sensor;

(i) first means responsive to engine loads for providing a first signal and cutting off the fuel injection signal to said second fuel injection means when the engine load is below a predetermined value;

(j) a load sensor for providing a second signal when the

engine load is below a predetermined value much lower than the value predetermined in said first means; and

(k) second means responsive to the first signal for closing said stop valve and opening said EGR valve and responsive to the first and second signal for closing said EGR valve and opening said air valve and for placing said signal generating means into its second mode of operation.

4,320,727

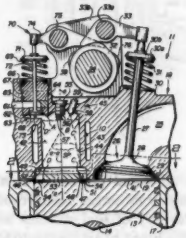
PROCESS OF FUEL STRATIFICATION WITHIN AND VENTING OF ENGINE AUXILIARY COMBUSTION CHAMBER

Noel G. Artman, 15830 Nicklaus La., Sun City, Ariz. 85351

Division of Ser. No. 105,074, Dec. 19, 1979. This application Dec. 23, 1980, Ser. No. 219,462

Int. Cl.³ F02B *3/00, 23/00*

U.S. Cl. 123—290 **8 Claims**



1. An internal combustion engine operational process involving an Otto cycle engine cylinder and a piston reciprocal therein attendant to alternate expansion and contraction of a variable volume space in said cylinder, an auxiliary combustion chamber having opposed endwall portions spaced apart axially of a principal axis of such chamber wherein an air-fuel mixture is combustible, and aspirating passage means communicating between said space and the interior of the chamber adjacently to one of said endwall portions; said process comprising the sequential steps of introducing air into said chamber contiguously to the other endwall portion during a portion of the air intake stroke of the piston to forcibly exhaust the products of a previously combusted air-fuel mixture from the chamber through the aspirating passage means into the variable volume space, next, pursuant to the ensuing compression stroke of the piston, compressing and forcibly introducing air from said space and through the aspirating passage means into said chamber contiguously to the one endwall portion with a swirling motion to a major portion of such introduced air about and converging toward said axis, injecting fuel into the swirling air in an amount to mix and form therewith a combustible air-fuel mixture, terminating the injection, continuing the introduction of air and swirl thereof to form a column of air compressing the combustible mixture into a discrete mass displaced by said column toward the other endwall portion, and igniting the compressed combustible mixture in such timed relation with movement of the piston that ensuing burning and heated gas composed of said fuel and air expands through the aspirating passage means into the variable volume space to effect a power stroke of the piston.

4,320,728

ENGINE PRECOMBUSTION CHAMBER WITH PROVISIONS FOR VENTING THEREOF AND FUEL STRATIFICATION THEREIN

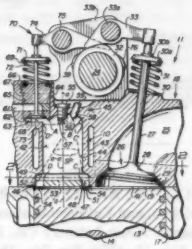
Noel G. Artman, 15830 Nicklaus La., Sun City, Ariz. 85351

Filed Dec. 19, 1979, Ser. No. 105,074

Int. Cl.³ F02B *3/00, 23/00*

U.S. Cl. 123—293 **13 Claims**

1. In an internal combustion chamber structure operable in combination with an engine cylinder having a head at an end thereof and a piston reciprocally in such cylinder to move away fron such head to expand a variable volume space receivable of air and thereafter toward said head to compress the air in such space; said structure being disposed in said cylinder head and having a sidewall with a substantially cylindrical interior periphery and endwall portions spaced apart axially of such periphery to complement the sidewall in the formation and enclosure of the combustion chamber of said structure; said structure comprising aspirating passage means communicating between the variable volume space and said combustion chamber and having a duct portion and a channel portion disposed in communicative series with the duct portion, the channel portion being an open channel in the inner periphery of said sidewall contiguous to one of said endwall portions and



extending circumferentially of said periphery within a plane substantially perpendicular to the principal axis of such periphery, said duct portion communicating with said variable volume space and leading therefrom through said one endwall portion in axial registry with the structure sidewall and disposed at an attitude of direction to discharge compressed air from the variable volume space linearly of and into said open channel, said structure also comprising a fuel injector communicating with the combustion chamber and adapted to direct fuel into the chamber to form a combustible air-fuel mixture with the air introduced into the chamber through the aspirating passage means, and air-fuel mixture igniting means disposed in said chamber adjacently to the other endwall portion of said structure.

4,320,729

SYSTEM FOR CONTROLLING IGNITION TIMING IN ENGINE

Daisaku Sawada; Takashi Shigematsu, and Yuji Takeda, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 25, 1979, Ser. No. 42,343

Claims priority, application Japan, May 26, 1978, 53-63568

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—425 **3 Claims**

1. A system for controlling ignition timing of an engine comprising:

means for generating an operation signal related to an operating condition of said engine;

means for generating a knocking signal related to knocking in said engine;

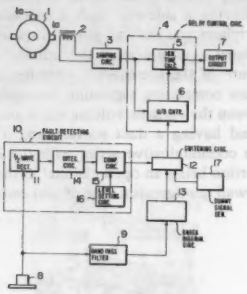
means for controlling said ignition timing in response to said operation signal and said knocking signal;

means for integrating said knocking signal;

means for generating a fault signal when said integrated knocking signal is beyond a predetermined threshold;

means for generating a dummy signal, said dummy having the effect of retarding said ignition timing to a timing at

which knocking is unlikely to occur when said dummy signal is applied to said controlling means; and



means for substituting said dummy signal for said knocking signal to said controlling means in response to said fault signal.

4,320,730

AIR-FUEL MIXTURE RATIO CONTROL DEVICE

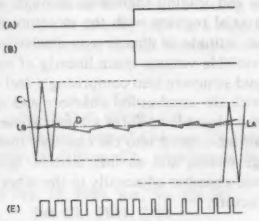
Shigetaka Takada, Ohbu, and Yukihiro Watanabe, Nagoya, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Sep. 25, 1979, Ser. No. 78,739

Claims priority, application Japan, Oct. 2, 1978, 53/121317

Int. Cl.³ F02D *35/00*

U.S. Cl. 123—440 **5 Claims**



1. An air-fuel mixture ratio control device for internal combustion engines, comprising

a control circuit,

an air-fuel ratio adjusting means for controlling the air-fuel ratio of the fuel mixture drawn into the internal combustion engine by means of an output of said control circuit,

said control circuit further comprising,

an exhaust gas sensor means disposed in an exhaust system of the internal combustion engine for detecting the density of exhaust gas components,

a deviation circuit including a means for detecting the deviation of an output of the exhaust gas sensor means from a reference value and putting out a deviation signal,

a triangular wave oscillation circuit means for producing a reference wave having a center value,

a proportioning circuit means for producing a proportional signal from said deviation signal,

another circuit means for comparing the proportional signal with said reference wave so as to provide a modulated pulse width,

an inversion amplifier connected to said triangular wave oscillation circuit and constituting means for varying the center value of the reference wave for pulse width modulation in accordance with operating conditions of the engine to effectively control the air-fuel ratio of the mixture to be supplied to the engine.

4,320,731

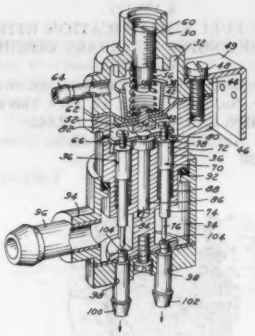
CARBURETOR AIR BLEED CONTROL SYSTEM

Paul E. Braun, Bloomfield Hills; Joseph F. Lopiccola, Troy, and Richard J. Freismuth, Mount Clemens, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1980, Ser. No. 109,731

Int. Cl.³ F02M *7/00*

U.S. Cl. 123—440 **1 Claim**



1. A carburetor air bleed control system for use with an automotive type engine mounted carburetor having an intake manifold, and a plurality of fuel systems and air bleeds connected thereto for the bleed of air thereinto to control fuel flow into the carburetor,

the system including a free standing air bleed control module, divorced from the carburetor for the separate mounting thereof at a selected location in the engine compartment of a vehicle in which the engine is installed, the module having a housing having a clean air inlet and a plurality of bleed air outlets adapted to be connected to a carburetor air bleed line, a plurality of metering valves variably movable into and out of the outlets to control flow of bleed air therethrough, spring means biasing the valves to a failsafe closed position blocking bleed air flow, and engine responsive movable actuating means connected to the metering valves as a function of changes in engine operating conditions, including

an electronic control unit having a plurality of electrical inputs adapted to be connected by sensors to the engine for receiving input signals therefrom indicative of changing conditions of operation of the engine, the control unit having an output signal means connected to the metering valve actuating means for effecting the movement of the metering valves in response to a predetermined signal from the control unit,

the housing having a cavity at one end, a flexible diaphragm extending across the cavity partitioning the cavity into a vacuum chamber and an air chamber on opposite sides, a variable level vacuum inlet in the housing connected to the vacuum chamber, the housing containing a bore slidably receiving therein the plurality of metering valves, a guide plate and force transmitter coaxially mounted with respect to the metering valves and connected thereto for moving the metering valves, the first mentioned spring means biasing the diaphragm into engagement with the guide plate to move the metering valves in cooperation with the air force, and second spring means biasing the metering valves to an open position first mentioned spring means,

the housing having a central bore slidably mounting the guide plate, the guide plate having a plurality of circumferentially spaced, coaxially located holes each fixedly and adjustably receiving therein the upper end of a metering valve, the metering valves each being mounted for a sliding movement in a bore coaxial with the central bore.

4,320,732

METHOD AND APPARATUS FOR GENERATING FUEL INJECTION CONTROL PULSES FOR AN INTERNAL COMBUSTION ENGINE

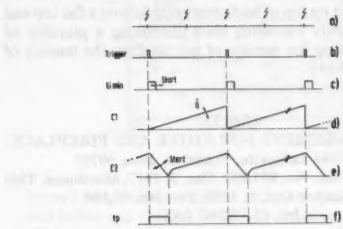
Hans Schnürle, Walheim; Ulrich Drews, Vaihingen-Pulverdingen, and Peter Werner, Wiernsheim-Iptingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,159

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2824007

Int. Cl.³ F02M *51/02*

U.S. Cl. 123—478 20 Claims



1. A method for generating fuel metering control pulses for an internal combustion engine, comprising the steps of:

generating a first electrical signal which varies as a function of an operational variable of the engine, said first electrical signal being continuous and periodic, and having two portions between its periodic limits;

generating a second electrical signal which is continuous and periodic, with a period substantially equal to the period of said first electrical signal, said second electrical signal having two portions of opposite slope between its periodic limits, with one of said portions varying as a function of said operational variable of the engine such that a substantial portion of its profile matches the profile of one of the two portions of said first electrical signal; and

generating a fuel metering control pulse, the width of which corresponds to the period of one of the two portions of the second electrical signal.

4,320,733

FUEL PUMPING APPARATUS

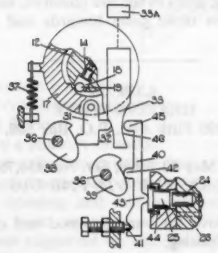
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 3, 1980, Ser. No. 165,675

Claims priority, application United Kingdom, Aug. 4, 1979, 27270/79

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 7 Claims



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a rotary member adapted to be driven in use, in timed relationship with the associated engine, a plunger located in a bore formed in the rotary member, an angularly adjustable cam member for imparting inward movement to the plunger as the rotary member rotates, means for conveying fuel displaced from said bore to an outlet, said cam being angularly movable to vary the timing of delivery of fuel from said bore, a shuttle movable in a cylinder to displace fuel from the cylinder to the bore to effect outward movement of the plunger, means for controlling the displacement of the shuttle thereby to vary the amount of fuel supplied to the outlet during inward movement of the plunger, an arm pivotally connected to and extending from said cam member in a plane generally perpendicular to the axis of rotation of said rotary member, an actuating member movable along an axis generally at right angles to said plane, a shaped surface defined on said actuating member for engagement by said arm whereby as the actuating member is moved axially angular movement will be imparted to the arm and the cam member, means responsive to the speed at which the apparatus is driven for varying the axial setting of said actuating member and an adjustable cam engageable with said arm at a position removed from its pivotal connection with the cam member, the setting of an operator adjustable control.

4,320,734

FUEL SUPPLY SYSTEM FOR DIESEL ENGINE

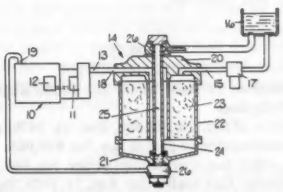
Chandrasegaram Balachandran, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 21, 1980, Ser. No. 141,895

Claims priority, application United Kingdom, Jun. 1, 1979, 19199/79

Int. Cl.³ H05B *1/02;* F02M *59/00*

U.S. Cl. 123—510 6 Claims

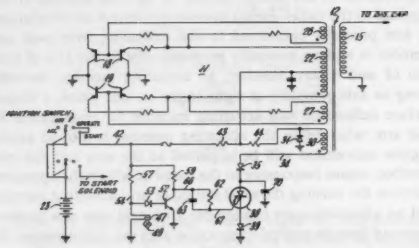


1. A fuel supply system for a diesel engine comprising a fuel pumping apparatus including a high pressure pump for supplying fuel to an injection nozzle of the engine, and a low pressure feed pump which draws fuel through a fuel inlet of the apparatus, and supplies the fuel to the high pressure pump, the apparatus also having a fuel outlet for the escape of fuel collecting within the housing of the apparatus, the system further including a filter connected to said inlet and through which fuel passes to said inlet from a fuel tank, the filter comprising first and second housing parts, the first of said housing parts defining a fuel inlet and a fuel outlet, the fuel outlet in use being connected to the inlet of the apparatus and the fuel inlet being connected to the supply tank, a filter element located between said housing parts, a through bolt acting to secure said housing parts in assembled relationship, a passage formed in said through bolt, and connection means communicating with said passage whereby at least a portion of the fuel flowing through the fuel outlet of the apparatus can be caused to flow through said passage, so that the fuel within the filter will be heated.

4,320,735
HIGH-FREQUENCY CONTINUOUS-WAVE IGNITION SYSTEM

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco, Inc., White Plains, N.Y.

Filed May 23, 1980, Ser. No. 152,946
Int. Cl.[3] F02P *3/02*; H03K *17/72*; F02P *1/00*
U.S. Cl. 123—606 3 Claims



1. In combination with a high-frequency continuous-wave ignition system for an internal combustion engine, said system including a square wave oscillator employing a unitary magnetic circuit and including a control winding for starting and stopping said high-frequency continuous-wave energy to generate a continuous AC spark whenever said oscillator is oscillating, said system also including means for timing said AC spark duration intervals relative to said engine, the improvement comprising

a gate turn off type silicon controlled rectifier for applying a low impedance path to said control winding concurrently with a DC current therethrough between each said spark duration interval, and

said spark duration timing means comprising engine timed means for controlling the conductive state of a transistor,

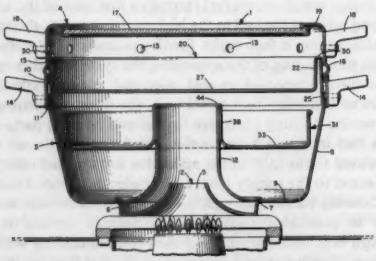
a resistor and capacitor connected in parallel with one end connected to the gate of said gate controlled rectifier and the other end connected to said transistor for grounding that end when said transistor is conducting, and

circuit means for connecting said engine timed means to the base of said transistor.

4,320,736
PORTABLE OVEN

Arthur A. Sharon, 11 Stella Maris St., Barrio Kapitolyo, Pasig, Rizal, Philippines

Continuation of Ser. No. 48,808, Jun. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 929,965, Aug. 1, 1978, abandoned, which is a continuation of Ser. No. 808,042, Jun. 20, 1977, abandoned. This application Aug. 14, 1979, Ser. No. 66,327
Claims priority, application Philippines, Jul. 12, 1976, 18692
Int. Cl.[3] A21B *1/00, 1/52*
U.S. Cl. 126—19 M 5 Claims



1. A portable oven comprising in combination

a base plate adapted to be placed on top of a gas burner or electric hot plate and having a circular flat bottomed portion with a slightly circumferential edge;

an oven body placed on top of said base plate having an upwardly extending wall and a substantially flat bottom wall with a circular groove and a frusto-conical opening in the center of said bottom wall;

a mess tray placed over said frusto-conical opening in the center of said oven body wall, said mess tray having a cooking area located below the top of said frusto-conical opening;

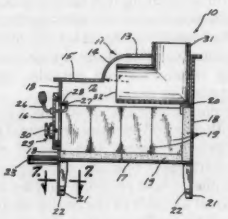
a skillet placed within said oven body and resting therein above the frusto-conical opening in said oven body by contact with said upwardly extending wall of said oven body; and

a cover placed on top of said oven body having a flat top and a downwardly extending skirt containing a plurality of holes allowing for passage of hot air from the interior of said oven body.

4,320,737
FLUE ARRANGEMENT FOR STOVE AND FIREPLACE

Mert L. Wolf, 2144 Lafayette, Waterloo, Iowa 50707

Continuation of Ser. No. 857,232, Dec. 5, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,689
Int. Cl.[3] F24C *1/00*
U.S. Cl. 126—58 1 Claim



1. A stove having a fire chamber, said stove consisting of:

a cooking surface defining the upper part of said fire chamber, said surface including a first flat rear surface, a second flat front surface defining a plane parallel to the plane of said first surface, and an arcuate surface interconnecting said first and second surfaces, said arcuate surface defining a ninety degree (90°) arc; and

a cylindrical flue attached to said stove and spaced from the rear wall of said fire chamber extending forwardly parallel to and below said arcuate surface, said flue having a forward open end, whose opening is in a plane perpendicular to said flat surfaces, and which terminates within said fire chamber at the midpoint of the radius of said arcuate surface; wherein, the plane of the opening is parallel to the plane of rising gases in the fire chamber, and said arcuate surface directs those gases towards said first flat rear surface.

4,320,738
HEATING STOVE

Virgil Johnson, 3200 Fifth Ave., P.O. Box 508, Marion, Iowa 52302

Filed May 30, 1980, Ser. No. 154,704
Int. Cl.[3] F24C *1/14*; F24B *7/00*
U.S. Cl. 126—77 1 Claim

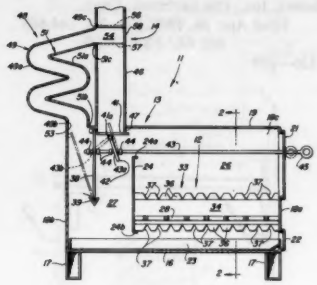
1. A heating stove for burning wood and coal fuel, said heating stove comprising:

stove means for burning fuel;

exhaust means, for removing combustion gases from said stove means, including first and second flue means extending from said stove means, said second flue means forming a serpentine passageway;

wherein a first baffle is mounted within said stove means and defines first and second combustion chambers, a grate being disposed within said first combustion chamber, said first and second flue means being connected to said second combustion chamber; and

further wherein an air supply means includes an air inlet



formed into said stove means, an opening formed through said baffle, and channel means, for forming an air passageway, extending from over said air inlet, through said first combustion chamber, to said baffle over said opening, said channel means having a first series of air outlets disposed above said grate and a second series of air outlets disposed below said grate.

4,320,739

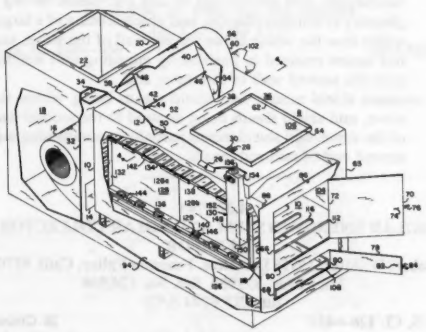
COMBUSTION TYPE HEATER

Murray O. Wilhoite, Huntsville, Ala., assignor to Martin Industries, Inc., Florence, Ala.

Filed May 25, 1979, Ser. No. 42,559

Int. Cl.³ F24H *3/02*; F24B *3/00*

U.S. Cl. 126—110 A **1 Claim**



1. A heating system comprising:

a combustion type heater comprising:

an enclosed firebox

formed by a plurality of walls,

one of said walls, being vertical, having first and second openings therein, said first opening being a larger, upper, opening, and said second opening being a smaller, lower, opening,

a first door supported by said vertical wall and positioned to cover said first opening,

a second door supported by said vertical wall and positioned to cover said second opening, and

a plenum around said firebox, other than around said vertical wall, and forming between said plenum and firebox an air space, said plenum having an inlet and outlet,

an outer door attached to said plenum and positioned adjacent to said openings in said firebox and outwardly spaced from said first and second doors,

biasing means for maintaining said second door on said firebox in an open position, and operating means attached to the interior of said outer door for overpowering said biasing means and maintaining said second door closed when said outer door is closed, and

a first fan and first motor powering said first fan and positioned to move air through said plenum from said inlet to said outlet opening; and

a second, adjacent, heater comprising:

heating means having an air entrance and air exit for heating air passing between said entrance and exit,

a second fan and a second motor powering said second fan and positioned to move air between said air entrance and air exit of said second heater,

said inlet of said plenum of said combustion type heater is connected to said air entrance of said second heater,

an air coupling path from said outlet of said plenum of said combustion type heater and connected to said air exit of said second heater,

a damper positioned in said air path, and operating means responsive to air flow from said outlet of said plenum of said combustion type heater for opening said damper, and responsive to an opposing air flow from said exit of said second heater for closing said damper,

first switching means for opening and closing an electrical circuit to said first motor of said combustion type heater,

second switching means for coupling electrical power to said second motor of said second heater, and

third switching means responsive to power to said first motor of said combustion type heater for alternately applying power to said second motor of said second heater,

whereby, when said first fan of said combustion type heater is powered, said second fan of said second heater is also powered by said second or said third switch means, whereby when said second fan of said second heater is powered and said first fan of said combustion type heater is not powered, said damper closes, whereby recirculation of air from one heater to another is prevented.

4,320,740

FIREPLACE HEATER WITH REFLECTOR, HEAT RETAINER, FORCED DRAFT AND GRATE

Carl O. Lassy, 376 South St., and William A. Lassy, 73 Grove Ave., Forestville Station, both of Bristol, Conn. 06010

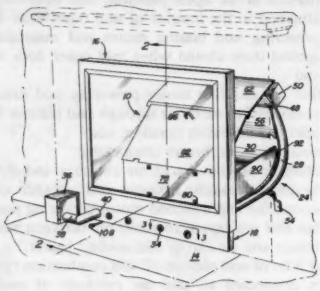
Filed Dec. 22, 1978, Ser. No. 972,474

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—121 **10 Claims**

1. A fireplace heater comprising a plurality of generally parallel tubular members interconnected to support a log or other fuel within a fireplace, each tubular member including a generally horizontal front portion and an upwardly extending rear portion adjacent the rear wall of the fireplace, a hollow heat chamber interconnecting and intercommunicating the upper ends of the rear portions of all of the tubular members, a hollow manifold interconnecting the front ends of the tubular members adjacent the front lower portion of the fireplace and communicating only with certain of the tubular members, the other tubular members including forward end portions projecting through the manifold, an air circulation means connected with and communicated with the manifold for forcing air into the manifold, through the tubular members communicated therewith into the heat chamber and then out through the

tubular members extending through the manifold for discharge of heated air at the forward lower end of the fireplace heater adjacent floor level, each tubular member being in the form of a pipe with the front portion and rear portion being interconnected by a curved portion with the rear portions extending upwardly and the heat chamber disposed adjacent a flue passageway of a chimney, and a grate setting on said pipes to provide a log support, said grate extending substantially completely over the front portions of the pipes, and a reflector plate extending between the rear edge of the grate and the heat chamber for reflecting radiant heat outwardly of the fireplace and reducing passage of heat into the rear wall of the fireplace.



4,320,741

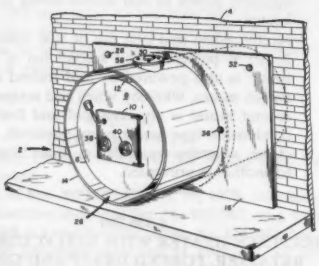
FIREPLACE HEATER STOVE

Harold W. Pierce, 4018 Highpoint Rd., Ellicott City, Md. 21043

Filed Jul. 23, 1979, Ser. No. 59,658

Int. Cl.³ F24C *1/14*; F24B *3/00*

U.S. Cl. 126—123 **11 Claims**



1. A heater stove which fits into a fireplace, the heater stove comprising:

a cylindrical firebox having (a) a front face, a back face, and a side wall having a closed-curve cross-section extending between the front face and the back face and (b) an axis directed into the fireplace when the heater stove is within the fireplace;

an outer cylindrical shell having a side wall and a back wall, the shell surrounding and being fixedly spaced apart from the back face and the side wall of the firebox, the shell and the firebox having an annular gap therebetween, the annular gap having an opening at the front of the stove; and

means for dividing the annular gap proximate the opening into a plurality of arcuate regions which extend a short distance in the axial direction, the regions being disposed between the firebox side wall and the shell side wall and the regions including at least one lower region into which unheated air is drawn and at least one upper region from which heated air exits, air drawn through the at least one lower region (a) mixing with air flowing in other of the regions, (b) being heated by the firebox, and (c) exiting through at least one of the at least one upper regions.

4,320,742

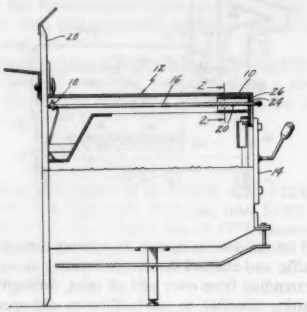
DAMPER ADJUSTING MECHANISM

Carl F. Piontkowski, Old Saybrook, Conn., assignor to C & D Distributors, Inc., Old Saybrook, Conn.

Filed Apr. 28, 1980, Ser. No. 144,665

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—289 **5 Claims**



1. In a stove, the stove having a firebox with oppositely disposed front and rear walls, the stove also having an exhaust port and an adjustable damper mechanism operatively associated therewith, the damper mechanism being manually movable between open and closed positions, an improved damper adjusting mechanism comprising:

damper adjustment rod means, said rod means being attached at a first end to the damper and having a second end extending through a hole in the front wall of the stove, said rod means being capable of moving in a first and second direction so as to open and close the damper mechanism, said second end of said rod means having a plurality of notches thereon, said notches being of a larger width than the width of the second wall of the stove, said rod means retained in position by engaging said notches onto the second wall of the stove; and

creosote shield means, said shield means being within the stove, said shield means being secured to the second wall of the stove, said shield means partially encompassing said second end of said rod means.

4,320,743

SOLAR ENERGY SYSTEM AND SOLAR COLLECTOR THEREFOR

Robert W. Allen, 15916 Los Altos, Fountain Valley, Calif. 92708

Filed Mar. 3, 1980, Ser. No. 126,996

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—432 **20 Claims**

1. A solar heat collector comprising solar absorber means for converting solar radiation into heat,

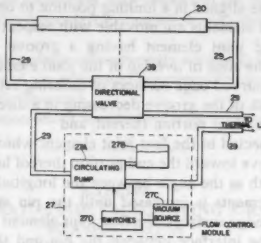
a heat transfer liquid for transferring heat from said solar absorber means,

means defining at least one passage for providing flow of said heat transfer liquid in contact with said solar absorber means and for enabling solar radiation to pass through the heat transfer liquid during the flow thereof through said at least one passage,

means, including a pump, for pumping said heat transfer fluid through said at least one passage to provide heating thereof by solar radiation and for supplying the heat transfer liquid for utilization after heating thereof in said at least one passage; and

means for creating a relative vacuum in said at least one

passage so as to minimize the creation of a stagnant boundary layer of said heat transfer liquid in contact with said



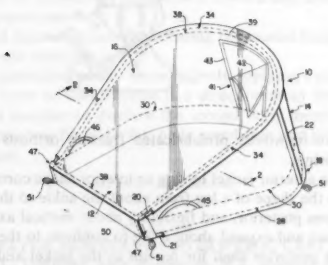
solar absorber means when said heat transfer liquid is pumped through said at least one passage.

4,320,744

SOLAR HEATED PORTABLE STRUCTURE

Eben V. Fodor, 3611 35th St., NW., Washington, D.C. 20016; John M. King, and Folly F. King, both of 5225 Pooks Hill Rd., Bethesda, Md. 20014

Filed May 15, 1980, Ser. No. 150,003
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **15 Claims**



1. A solar heated collapsible and portable structure comprising:

a flexible bottom panel that is dark in color to absorb radiant energy;

a flexible side assembly coupled to said bottom panel;

a flexible transmitting panel coupled to said bottom panel and side assembly;

a support frame coupled to said transmitting panel to support said transmitting panel above and over said bottom panel,

said bottom panel, side assembly and transmitting panel forming an enclosed chamber so that wind cannot easily penetrate the interior defined thereby,

said transmitting panel being capable of transmitting a majority of the radiant energy from the solar radiation spectrum to heat said enclosed chamber and act like a sauna,

the area of said transmitting panel being at least 0.7 the area of said bottom panel; and

means for selectively venting said enclosed chamber to the atmosphere and for providing ingress and egress to said enclosed chamber,

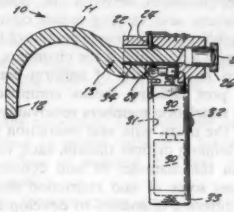
whereby persons in said enclosed chamber can enjoy the heated space defined thereby.

4,320,745

FIBER OPTICS LARYNGOSCOPE

Somsak Bhitiyakul, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Jan. 14, 1980, Ser. No. 111,832
Int. Cl.³ A61B *1/26*
U.S. Cl. 128—11 **5 Claims**



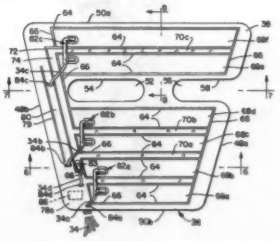
1. A laryngoscope comprising a blade with a rear extension in combination with a handle in which said extension is mounted removably, said blade and extension being formed of light transmitting material, said extension including spaced tongues, one of which transmits light to said blade and the other tongue receives images from said blade, said handle having a viewer aligned with the said other tongue and a lamp aligned with the said one tongue.

4,320,746

COMPRESSION DEVICE WITH IMPROVED PRESSURE CONTROL

Edward J. Arkans, Schaumburg, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Dec. 7, 1979, Ser. No. 101,358
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **11 Claims**



1. A device for applying compressive pressures against a patient's limb from a source of pressurized fluid, comprising:

an elongated pressure sleeve for enclosing a length of the patient's limb, said sleeve having a plurality of laterally extending separate fluid pressure chambers progressively arranged longitudinally along the sleeve from a lower

portion of the limb to an upper portion of the limb proximal to patient's heart relative to said lower portion;

conduit means for establishing communication between a fluid source and the sleeve chambers;

means for varying the effective lumen size of the conduit means associated with a plurality of chambers at a location downstream relative to the source to vary the pressure rise times in said chambers; and

means for intermittently inflating and deflating said pressure chambers, said conduit means comprising a plurality of conduits communicating with a source, and means for connecting downstream end portions of the conduits to the chambers to establish communication between the conduits and chambers, said varying means being located in said connecting means, said connecting means comprising a plurality of connecting members connected to the downstream end portions of said conduits, and a plurality of adapters connected to the sleeve in communication with the sleeve chambers, said connecting members being detachably connected to said adapters, port means establishing communication between the conduits and the sleeve chambers, said varying means comprising means for defining different effective diameters of the port means associated with a plurality of the chambers, said connecting members having ports of uniform diameter, and in which the port defining means comprises removable, replaceable restriction members removably received in a plurality of the ports, with said restriction members having means defining orifices therein, each with a diameter smaller than the diameter of said connecting member ports, at least some of said restriction members having orifices of differing diameters to develop a compressive pressure gradient against a patient's limb by the sleeve which progressively decreases from a lower to an upper limb portion, said restriction members being removable and replaceable so that the profile of said compressive pressure gradient may be changed.

4,320,747

SLIDABLY-COUPLED JOINT

Roy B. Daniell, Jr., 4221 N. Shallowford Rd., Apt. 4, Chamblee, Ga. 30341

Filed Oct. 6, 1980, Ser. No. 194,469
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **11 Claims**

1. A joint for use in knee braces and the like, comprising:

first and second joint elements having overlapping end portions, the first joint element having a guide formed therein within the zone of overlap of the joint elements, the guide including a straight edge surface;

a means connected to the second joint element for retaining the joint elements in overlapping relation, the retaining means having an eccentric member which protrudes into the guide, the eccentric member having a shoulder which abuts against the straight edge surface of the guide when the joint elements are aligned in a limiting position to one side of which the joint elements are movable with respect to one another;

the second joint element having a groove formed therein within the zone of overlap of the joint elements, the groove having curved edge surfaces of differing radii of curvature, the width of the groove decreasing in a direction toward at least one distal portion thereof; and

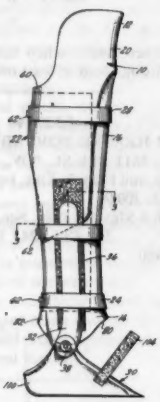
a pin connected to the first joint element which moves within the groove toward the end portion thereof having a decreasing width as the angle between the longitudinal axes of the joint elements is increased until the pin abuts one of the curved edge surfaces, the first joint element being pivotable about the interface between the pin and the curved edge surface to bring the shoulder into positive contact with the guide, thereby locking the joint with respect to any further increase in the angle between the longitudinal axes of the first and second joint elements.

4,320,748

FRACTURE BRACE

Walter L. Racette, La Habra, and David L. Porter, Sunset Beach, both of Calif., assignors to Orthomedics, Inc., Brea, Calif.

Filed Nov. 20, 1980, Ser. No. 208,504
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 F **17 Claims**



1. An improved prefabricated fracture orthosis for a leg comprising:

(a) an anterior jacket having an interior shape corresponding to the shape of a leg from about the ankle to the knee, an open posterior, and flexibility about vertical axes to contract and expand about a leg to conform to the leg;

(b) a posterior shell for receipt in the jacket and having a closed posterior side, a shape generally conforming to the shape of a calf from about the ankle to the top of the calf, and flexibility about vertical axes to expand and contract into contact with the calf to conform to the calf;

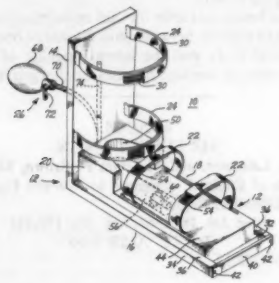
(c) means to secure the shell to the jacket while encasing a patient's leg to permit loading of the soft tissue of the leg and the tibia and fibula without unacceptable angulation or rotation;

(d) a footplate;

(e) a lateral and a medial upright each pivotally attached to the footplate to permit rotation of the footplate about generally horizontal, pivotal axes extending from the medial side of a patient's leg to the lateral side; and

(f) means for attaching the medial and lateral uprights to the jacket with each upright having an infinite number of positions within predetermined ranges:
(i) in vertical translation with respect to the jacket,
(ii) in anterior-to-posterior translation with respect to the jacket,
(iii) in rotation about axes generally normal to the longitudinal axis of the jacket and corresponding to the axis of a patient's foot, and
(iv) in rotation about longitudinal axes of the jacket.

4,320,749
APPARATUS FOR FACILITATING X-RAY EXAMINATIONS
Robert D. Highley, 18236-24th Ave. NE., Seattle, Wash. 98155
Filed Dec. 22, 1980, Ser. No. 218,617
Int. Cl.³ A61F 5/04
U.S. Cl. 128—83 18 Claims

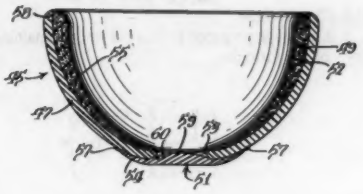


1. An apparatus for facilitating X-ray examinations of joints interconnecting first and second body members, said apparatus comprising:
(a) a support member;
(b) first securing means for securing the first body member to said support member;
(c) a carriage for supporting the second body member for movement relative to said first body member, said carriage adapted for movement transversely toward and away from said support member;
(d) second securing means for securing the second body member to said carriage; and
(e) force generating means for selectively applying a predetermined force on said carriage in a direction away from said support member to displace the second body member in a direction away from the first body member at said joint to be examined.

4,320,750
WATER RESISTANT ORTHOPEDIC CAST
Winifred C. Dabroski, East Brunswick, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.
Filed Aug. 29, 1980, Ser. No. 182,544
Int. Cl.³ A61F 5/04
U.S. Cl. 128—91 R 5 Claims

1. A method of forming a water-resistant orthopedic cast comprising immersing a plaster of Paris cast bandage into water containing a dispersion of from 2% to 15% by weight of wax solids, at least 51% of said wax solids being paraffin waxes having a melting point between 100° F. and 160° F., said wax solids being dispersed in said water with a cationic or nonionic surfactant; removing the cast bandage from the aqueous dispersion and applying the bandage to form a cast.

4,320,751
CERVICAL CAP WITH FOAM LINING
Marvin P. Loeb, Chicago, Ill., assignor to Contracap, Inc., Arlington Heights, Ill.
Filed Feb. 19, 1980, Ser. No. 122,541
Int. Cl.³ A61F 5/46
U.S. Cl. 128—127 22 Claims



1. A non-invasive birth control device which comprises
an elastomeric cup for positioning over cervix uteri, having a substantially concave inner wall defining an aperture therein at the apex of the cup and substantially in alignment with the cervical os when the cup is positioned in place;
closure means associated with said cup and situated over said aperture to permit outflow of uterine discharge but prevent inflow of material into said cup through said aperture; and
a resiliently form-assuming inner liner member situated within said cup, integral with said concave wall, extending circumferentially about said wall, and defining a continuous inner cup surface portion for contacting the surface of portio vaginalis cervicis, said inner cup surface portion being more flexible than said concave wall.

4,320,752
MULTI-BAND OR NETWORK MALE CONTRACEPTIVE
John E. Comparetto, 108 Cropper St., Chincoteaque, Va. 23336
Filed Jul. 30, 1979, Ser. No. 62,073
Int. Cl.³ A61F 5/42
U.S. Cl. 128—132 R 14 Claims

1. A receptacle apparatus of impervious to semen material with overlapping leaves forming valves and; adhesive peripheral areas for adherence to the glans penis while covering the penile orifice, where said peripheral areas have concentric adhesive rings with breaks in adhesive continuity.

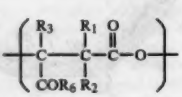
4,320,753

MALIC ACID POLYMERS

Robert W. Lenz, Amherst, Mass., and Michel Vert, Deville-les-Rouen, France, assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 92,183, Nov. 7, 1979, Pat. No. 4,265,247. This application Nov. 9, 1979, Ser. No. 92,963
Int. Cl.³ A61F 13/00
U.S. Cl. 128—156 5 Claims

1. A bandage prepared from a polymer containing repeating units of the formula:



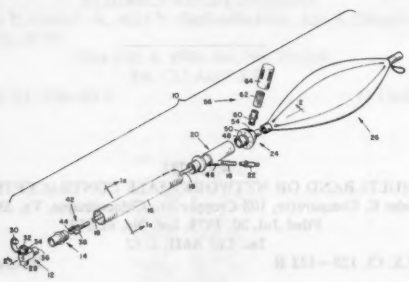
wherein R_1 and R_2 are independently hydrogen, alkyl, aryl, aralkyl, substituted alkyl, substituted aryl, substituted aralkyl, R_3 is hydrogen, alkyl or $—(CH_2)_n COOR_8$ where n is an integer of 0 to 10, R_6 is OR or NR_4R_5, wherein R and R_8 are independently hydrogen or a group derived from a compound containing esterifiable hydroxyl groups, R_4 and R_5 are independently alkyl, aryl, aralkyl, substituted alkyl, substituted aryl, substituted aralkyl or together comprise an alkylene group.

4,320,754

CONTROLLABLE PARTIAL REBREATHING ANESTHESIA CIRCUIT AND RESPIRATORY ASSIST DEVICE

Robert L. Watson, 14312 Piccadilly Rd., Silver Spring, Md. 20906, and Robert L. Rayburn, 495 N. Hills Dr., Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 840,400, Oct. 7, 1977, Pat. No. 4,188,946. This application Dec. 21, 1979, Ser. No. 106,286
Int. Cl.³ A61M 16/00
U.S. Cl. 128—204.25 9 Claims



1. An inhalation breathing circuit for supplying fresh gases to a patient from source of fresh gases comprising:

a fresh gas tube having a fresh gas passage therethrough, said fresh gas tube having a first end including means adapted to be connected to a source of fresh gases and an opposite second end;

an exhalation tube having an exhalation passage therethrough, said exhalation tube having a first end and an opposite second end, said fresh gas tube extended through said exhalation passage with both said second end of said exhalation tube and said second end of said fresh gas tube terminating immediately adjacent said patient;

a short mixing connector for connecting said second end of said exhalation tube to said patient;

tip means connecting to said second end of said fresh gas tube adjacent said patient, said tip means being located inside said short mixing connector, said tip means having radial passages for discharging said fresh gases radially inside said short mixing connector;

circuit connector means with a main exhaust passage therethrough having a first end connected to said first end of said exhalation tube and an opposite second end, a fresh gas tube opening in said circuit connector means for receiving said fresh gas tube therethrough and into said main exhaust passage; and

exhaust control means having a cylindrical body with a longitudinal passage therethrough having one end connected to the second end of said main exhaust passage of said circuit connector means and an opposite second end, said opposite second end of said cylindrical body having means adapted to be connected to a reservoir bag, said cylindrical body having a discharge opening through a side of said cylindrical body extending laterally to said longitudinal passage, a sleeve with a lateral opening being rotatably mounted on said cylindrical body, said lateral opening being rotatably alignable with said discharge opening and being adapted for connection to an anesthetic scavenging system;

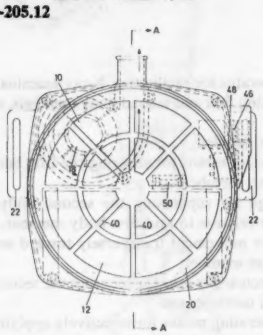
said sleeve being rotatable on said cylindrical body to vary amount of overlap between said discharge opening of said cylindrical body and the lateral opening of said sleeve which controls amount of gases discharged during use.

4,320,755

AIR SUPPLY UNITS

Leslie Flint, Leicester, and Malcolm P. Brown, Melton Mowbray, both of England, assignors to Marwin Foundry Units Limited, Leicester, England

Filed Jul. 18, 1980, Ser. No. 170,141
Int. Cl.³ A62B 7/00
U.S. Cl. 128—205.12 4 Claims



1. An air supply unit for use with a facemask comprising a casing (34) having a chamber therein, a centre plate in said chamber dividing said chamber into first and second compartments, a passage in said center wall communicating said first and second compartments, a centrifugal fan (10) mounted in said first compartment and having an intake portion communicating with said passage and an output portion, an outlet duct (14) extending from said first compartment and being in flow communication with the output portion of the centrifugal fan (10) said outlet duct including means adapted to be connected to a face mask, an electric motor (18) mounted in said first compartment including means for driving the fan (10), a battery (20) mounted in said first compartment and having electrical means associated therewith for powering the motor (18), said center plate (36) forming an integral part of the casing (34), said motor (18), said fan (10), said battery (20) and said electrical means being secured to the center plate (36), said second compartment having an outer wall opposite said center wall comprised of an aperture cap (24) secured to said casing with screw threads (26), and a filter unit (12) mounted in said

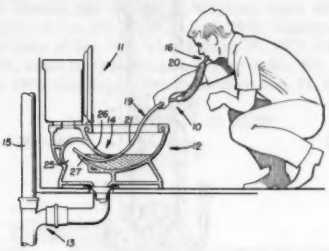
second compartment and being in flow communication with said apertured cap and said passage, said filter being held in position by said apertured cap (24), and wherein said apertured cap includes a peripheral rim (20) and a central part (40) removable from said rim whereby a supplemental filter unit (44) can be supported by said rim.

4,320,756

FRESH-AIR BREATHING DEVICE AND METHOD

William O. Holmes, 1331 Old Country Rd., Belmont, Calif. 94402

Filed Feb. 25, 1981, Ser. No. 237,869
Int. Cl.[3] A62B 7/10, 7/12
U.S. Cl. 128—206.12 4 Claims



1. A method for breathing fresh air in a room filled with toxic smoke comprising the steps of

inserting a breathing tube through a water trap of a toilet to expose an open end thereof to fresh air from a vent pipe connected to a sewer line of said toilet, and

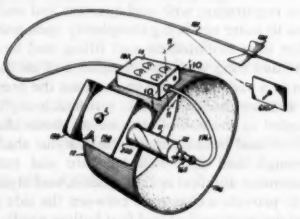
breathing said fresh air through said breathing tube.

4,320,757

SELF CONTAINED INJECTION SYSTEM

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,235. This application Mar. 27, 1981, Ser. No. 248,260
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—214 F 3 Claims



1. Apparatus for injecting fluid into a patient at an average prescribed rate over a prolonged period of time comprising:

carriage means defining a fluid chamber therein carrying fluid to be dispensed and including opposed closed ends, each of said closed ends defining a fluid outlet therethrough from said chamber connected to the patient;

a magnetically responsive piston slidably mounted in said fluid chamber for reciprocal movement back and forth between said opposed ends of said fluid chamber for forcing fluid from each of said fluid outlets as said piston is moved toward said outlet and so that said opposed ends of said fluid chamber limit the movement of said piston along said fluid chamber;

an electrical power supply;

electrically operated driving means including solenoid coil means around said chamber to alternatively move said piston from each end of said fluid chamber to the other when said solenoid coil means is connected to said power supply;

said carriage means defining a fluid inlet to said fluid chamber so that fluid may be introduced into said fluid chamber to fill said fluid chamber between said piston and the end of said fluid chamber opposite said piston; includes inlet valve means for permitting fluid to flow only into said fluid chamber through said fluid inlet, and outlet valve means for permitting fluid to flow out of said fluid chamber through either of said fluid outlets while said piston is moving toward each of said fluid outlets; and

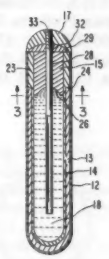
control means for selectively connecting said electrical power supply to and disconnecting said electrical power supply from said electrical driving means to energize said solenoid coil means to alternatively move said piston toward one of the closed ends of said fluid chamber and then toward the other to alternately force fluid from one of said fluid outlets and then from the other at a rate such that fluid is injected into the patient at the desired average rate over the prolonged period of time.

4,320,758

OSMOTICALLY DRIVEN FLUID DISPENSER

James B. Eckenhoff; Johan H. Geerke, both of Los Altos, and Felix A. Landrau, Milpitas, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 36,815, May 7, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,182
Int. Cl.[3] A61M 7/00
U.S. Cl. 128—260 5 Claims



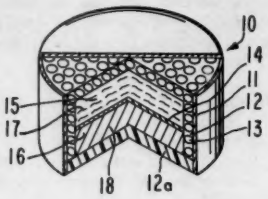
1. In an osmotically driven fluid dispenser comprising an inner flexible bag adapted to contain the fluid, an intermediate layer of an osmotically effective solute composition at least partly encapsulating the bag, an outer, shape-retaining membrane encapsulating the layer of osmotically effective solute composition, said membrane being at least in part permeable to water, and a port that extends from the interior of the bag to the exterior of the dispenser through which the fluid may be charged into the bag and dispensed from the bag, the improvement wherein the layer of the osmotically effective solute composition is in the form of a thermoformed sleeve consisting essentially of a dispersion of about 50% to about 90% by weight osmotically effective solute, in about 10% to about 50% by weight water soluble thermoplastic polymer vehicle.

4,320,759

DISPENSER WITH DIFFUSER

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 144,210, Apr. 28, 1980. This application May 28, 1981, Ser. No. 268,046
Int. Cl.³ A61M 7/00
U.S. Cl. 128—260 8 Claims



1. A diffusor for the controlled delivery of a beneficial agent at a zero order rate of release for an increased length of time to a fluid environment of use, the diffusor comprising:

a. a wall formed in part of a microporous polymer with the remaining part formed of a semipermeable polymer surrounding and forming;

b. a compartment having an internal space;

c. a beneficial agent in the compartment occupying part of the space;

d. an osmotically effective solute in the compartment occupying the remainder of the space, said solute in contact with the part of the wall formed of a semipermeable polymer; and,

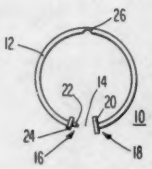
e. a flexible partition formed of a member selected from the group consisting of a semipermeable polymer and an impermeable polymer in the compartment, which partition is joined to the wall and placed between the beneficial agent and the osmotic solute.

4,320,760

ACUPRESSURE METHOD

Evelyn L. Sun, Bala Cynwyd, and Robert J. Sun, Easton, both of Pa., assignors to Suntex Products, Inc., Easton, Pa.

Division of Ser. No. 897,278, Apr. 17, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,727
Int. Cl.³ A61H 39/04
U.S. Cl. 128—303 R 2 Claims



1. A method of using a device of the type having a mounting with two clamping members attached thereto, said members being adapted to be positioned on opposite sides of the external ear, one of said members having a blunt surface for applying pressure to a selected region on one side of said ear, the other said members terminating in a pad surface, the surface area of said pad surface being larger than the surface area of said blunt surface, said method comprising the steps of:

selecting a point within said region from an acupuncture/acupressure map of the ear;

locating said blunt surface adjacent said region on said one side of the ear;

locating said pad surface on the opposite side of said ear; and

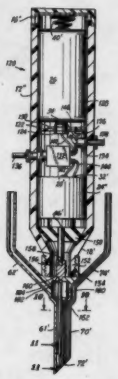
stimulating said point by applying pressure thereto through said blunt surface without penetrating the skin.

4,320,761

SURGICAL DEVICE FOR EXCISION OF TISSUE

Heskel M. Haddad, 1200 Fifth Ave., New York, N.Y. 10029

Continuation of Ser. No. 9,894, Feb. 6, 1979, abandoned, which is a continuation of Ser. No. 763,490, Jan. 28, 1977, abandoned. This application Aug. 13, 1980, Ser. No. 177,706
Int. Cl.³ A61B 17/32
U.S. Cl. 128—305 11 Claims



1. A surgical device for excision of tissue and flushing same away, comprising housing means adapted for support in a hand of a user; motor means mounted in said housing and having a rotatable output shaft projecting through a wall in said housing means; means for powering said motor means in said housing means, said housing means being formed to provide a watertight seal about said motor means shaft extending therethrough; a fitting; releasable coupling means formed in said fitting and in the exterior region of said housing means surrounding said motor shaft extending therethrough for releasably coupling said fitting and said housing means; said fitting being formed with a chamber therein defined, in part, by an end wall formed with an aperture therethrough in registration with said motor means shaft; a first hollow needle mounted on said fitting with its inner end in communication with said chamber and in registration with said aperture and said motor means shaft and its outer end being completely open and free of end wall; a first tube mounted on said fitting and having an inner end communicating with said chamber and an outer end for connection to a vacuum source to decrease the pressure in said chamber and first hollow needle; a rotatable stylus shaft releasably coupled to the end of said motor means shaft projecting outside of said housing means, said stylus shaft being journalled through said end wall aperture and extending through said chamber and first hollow needle, said stylus shaft being shaped to provide a clearance between the side periphery thereof and the inner wall of said first hollow needle for the passage of tissue and fluid therebetween, and being shaped to at least aid in the drawing of tissue from the end thereof to and through a portion of said first needle when said shaft is rotated, the end of said stylus being shaped to cut tissue in contact therewith; a second hollow needle parallel to and secured to said first needle and essentially contiguous therewith; the outer end of said second needle being essentially flush with the outer end of said first needle, the outer ends of said first and second needles being bevelled, the cutting end of said stylus being positioned essentially at the cutaway region defined by the bevel in the end of said first needle; a second tube mounted on said fitting for support thereby and having an inner end cou-

pled to the inner end of said second hollow needle and its outer end adapted for connection to a source of washing fluid; whereby the combination of introduction of washing fluid into the vicinity of the cutting end of said stylus shaft when rotating, a drop of pressure in said first hollow needle and the operation of said stylus shaft results in the flushing away through said first hollow needle, said fitting chamber and out said first tube of tissue excised by said rotating stylus shaft and fluid associated therewith, and whereby said fitting, first and second tubes and first and second hollow needles may be removed from said housing as a unit.

4,320,762

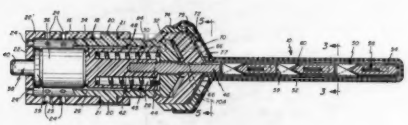
DILATOR

Itzhak E. Bentov, 241 Glezen La., Wayland, Mass. 01778

Continuation of Ser. No. 27,299, Apr. 5, 1979, abandoned, which is a division of Ser. No. 781,183, Mar. 25, 1977, Pat. No. 4,684,709, which is a continuation-in-part of Ser. No. 625,314, Mar. 10, 1975, abandoned. This application Jan. 21, 1980, Ser. No. 114,061

Int. Cl.³ A61M *29/00, 16/00*

U.S. Cl. 128—343 **21 Claims**



1. A dilator for internal body use comprising;

an elongated probe means including an elongated core, an expandable outer shell and means associated with said core and shell for causing said shell to expand radially when the core moves longitudinally relative to said shell and in a direction away from the distal end of the shell,

means defining a housing forming an at least partially closed chamber and having means for receiving an end of the probe means,

means for biasing the probe means into the chamber,

and a disintegratable member that is relatively solid at ambient conditions but that disintegrates upon exposure to ambient body conditions disposed to hold the probe means under bias until the dilator is inserted in the body, the biasing means thereafter causing the probe means to move gradually into the chamber with the core moving longitudinally relative to the shell away from the distal end of the shell to cause the shell to expand.

4,320,763

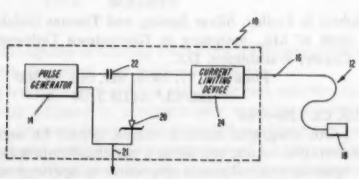
PROTECTION DEVICE FOR PACEMAKER IMPLANTEES

David Money, Pennant Hills, Australia, assignor to Telectronics Pty. Limited, Lane Cove, Australia

Filed Oct. 10, 1979, Ser. No. 83,522

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **6 Claims**



1. In a pacemaker assembly comprising pulse-generator means for generating electrical pulses and electrode means having a proximal end coupled to said pulse-generating means and a distal end designed to be placed adjacent to body tissue for delivering said pulses to said tissue, the improvement comprising:

current-limiting means coupled in series with said pulse-generating means and said electrode means for permitting passage of said electrical pulses to said tissue and for protecting said tissue against tissue damaging current flow between said distal end of said electrode means and said tissue as may occur with cardioversion.

4,320,764

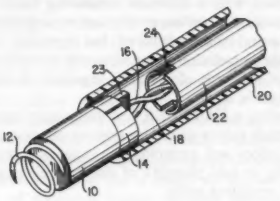
FETAL ELECTRODE

Edward H. Hon, Bradbury, Calif., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 13, 1980, Ser. No. 159,113

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **7 Claims**



1. Apparatus for use in measuring continuously the change of pH of a fetus, comprising

a holder made of an insulating material,

a first electrode extending from the forward end of said holder and shaped to attach to the fetus during delivery to secure said first electrode thereto, said first electrode consisting of a solid material which, in the presence of hydrogen ions, will form a first half cell,

a second electrode secured to said holder and consisting of a material which, in the presence of hydrogen ions, will form a second half cell, said second electrode being spaced on said holder relative to said first electrode so as to respond to maternal pH values,

and means responsive to the difference between the voltages produced by said first and second half cells for continuously measuring the changes in pH of the fetus.

4,320,765

DOPPLER PSEUDORANDOM NOISE VELOCIMETERS

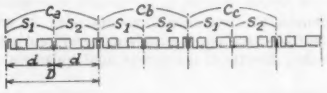
Dominique Cathignol, Genas; Claude Fourcade, Tassin la Demi Lune, and Jean-Yves Chapelon, Saint-Etienne, all of France, assignors to Institut National de la Sante et de la Recherche Medicale - I.N.S.E.R.M., France

Filed Jan. 16, 1980, Ser. No. 112,528

Claims priority, application France, Jan. 19, 1979, 79 02136

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 **7 Claims**



1. A method for measuring velocity and distance of a moving target within a conveying medium comprising the steps of:

generating a continuous pseudorandom ultrasonic noise signal formed of a repetitive code composed of a plurality of different elementary segments;

transmitting said continuous pseudorandom ultrasonic noise signal generated in the direction of a target;

developing a delayed continuous pseudorandom ultrasonic noise signal corresponding to said continuous pseudorandom ultrasonic noise signal generated and delayed by a value representative of the distance to be scanned;

receiving echo signals from said moving target and said conveying medium;

correlating each different elementary segment in said received echo signals with corresponding elementary segments in said delayed continuous pseudorandom ultrasonic noise signal in a sequence corresponding to a sequence in which each of said plurality of different elementary segments in said echo signals are received to obtain a correlation value for each of said plurality of different elementary segments in said received echo signals, said correlation of each different elementary segment received with a corresponding elementary segment in said delayed continuous pseudorandom ultrasonic noise signal being conducted with a different measuring band for each of said plurality of different elementary segments and for a period equal to the period of that segment;

storing said correlation value obtained for each of said plurality of different elementary segments in said received echo signals; and

reconstituting a DOPPLER low frequency signal from the correlation values stored by reading out said stored correlation values and grouping the same in a manner corresponding to said plurality of different elementary signals in said repetitive code.

4,320,766

APPARATUS IN MEDICINE FOR THE MONITORING AND OR RECORDING OF THE BODY MOVEMENTS OF A PERSON ON A BED, FOR INSTANCE OF A PATIENT

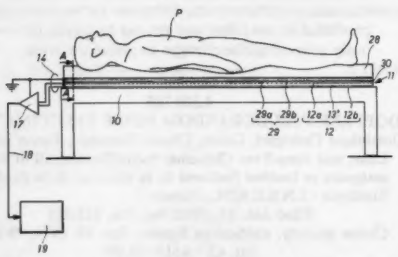
Jukka Alihanka, Littoinen; Kaarle Vaahtoranta, and Stig-Eyrik Björkqvist, both of Turku, all of Finland, assignors to Instrumentarium Oy, Helsinki, Finland

Filed Mar. 10, 1980, Ser. No. 128,835

Claims priority, application Finland, Mar. 13, 1979, 790847; Nov. 27, 1979, 793713

Int. Cl.³ A61B 5/10

U.S. Cl. 128—671 **11 Claims**



1. An apparatus for monitoring the movements of a person on a bed or the changes therein, such movements including epileptic convulsive seizures, other deviant movements, tremors, respiration, mechanical cardiac functions, or any other motorics of the person under examination, without attaching a pick-up means directly to the person, said apparatus comprising:

(a) an active layer;

(b) an antenna means;

(c) an amplifying means connected to said antenna means; and

(d) a monitoring means connected to said amplifying means; wherein said active layer comprises at least two mutually contacting courses of insulating material having different dielectric constants adapted so that an electrical charge is generated in said layer by relative movement between said contacting courses; and wherein said antenna means is adapted to detect electrical charge generated within said active layer, resulting in an electrical signal being conveyed from said antenna means to the amplifying means and amplified therewith, said amplified signal being conveyed to the monitoring means and converted into a visual, auditory or mechanical signal therewith.

4,320,767

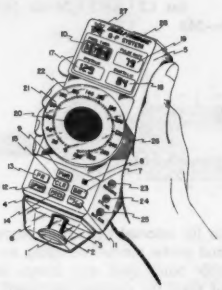
POCKET-SIZE ELECTRONIC CUFFLESS BLOOD PRESSURE AND PULSE RATE CALCULATOR WITH OPTIONAL TEMPERATURE INDICATOR, TIMER AND MEMORY

Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121

Filed Apr. 7, 1980, Ser. No. 137,607

Int. Cl.³ A61B 5/02

U.S. Cl. 128—680 **52 Claims**



1. A cuffless electronic blood pressure device including a non-circumferentially engaging pressure applying means, transducer means responsive to the compression degree of the said pressure applying means, acoustical sensor means coupled to said pressure applying means for detecting pulse rate or heart rate sounds and producing an electrical signal in response thereto, systolic signal producing means coupled to said acoustical sensor means for producing a signal representing the systolic pressure of the user, diastolic signal producing means coupled to said acoustical sensor means for producing a signal representing the diastolic pressure of the user, the systolic and diastolic signals produced being an analog representation coordinated to the analog representation of the degree of compression and decompression of the subjected tissues by the non-circumferentially engaging pressure applying means, converting means for changing said analog representation of the systolic and diastolic signals to digital visual displays thereby indicating the respective systolic and diastolic pressure of the user.

4,320,768

COMPUTERIZED ELECTRO-OCULOGRAPHIC (CEOG) SYSTEM

Robert S. Ledley, Silver Spring, and Thomas Golab, Beltsville, both of Md., assignors to Georgetown University Medical Center, Washington, D.C.

Filed Jul. 17, 1979, Ser. No. 58,300

Int. Cl.³ A61B 5/04

U.S. Cl. 128—733 **29 Claims**

1. An integrated medical testing system for automated administration of test stimuli to a patient, comprising:

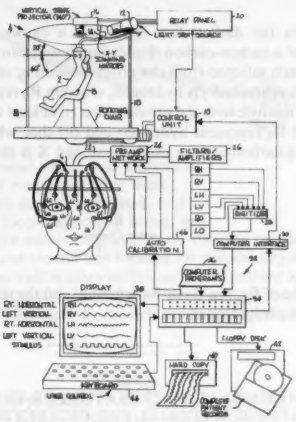
operator control means responsive to operator selection of a desired stimuli to be administered to said patient for providing processor input signals corresponding to said selection;

processor means responsive to said processor input signals

from said operator control means for generating control signals indicating said desired stimuli to be administered; and

stimulation control means responsive to said control signals from said processor means for automatically administering said stimuli to said patient;

said system further comprising a rotatable chair, said stimulation control means comprising a motor controller responsive to said control signals from said processor means for rotating said rotatable chair so as to administer said stimuli to said patient;



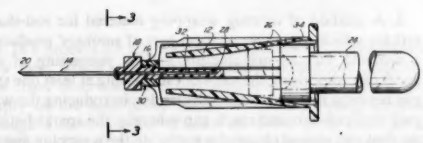
wherein said control signals include rotation signals commanding rotation of said rotatable chair for a given number of turns, said motor controller being responsive thereto for rotating said rotatable chair through said given number of turns, and then stopping said rotation of said rotatable chair.

4,320,769

UNIVERSAL HOLDER FOR BLOOD COLLECTING TUBES

Edward C. Eichhorn, Dumont; Edward L. Nugent, North Caldwell, and Shenoda S. Megahed, Lyndhurst, all of N.J., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed May 19, 1978, Ser. No. 907,757
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—763 24 Claims



1. A holder capable of holding body fluid collection containers of various diameters, said holder comprising:

a housing having a forward end and a rear end, said forward end being adapted to accommodate a needle assembly having a first end designed for penetration of the body and a second end designed for penetration of a closure of an evacuated collection container, and said rear end adapted for the insertion of a fluid collection container; and

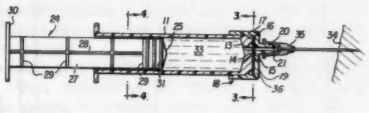
a plurality of deformable ribs attached to and disposed inwardly of the housing, said ribs being able to frictionally engage collection containers of various diameters.

4,320,770

DIAGNOSTIC SPECIMEN COLLECTOR

Roger F. Etherington, Newport Beach, and Clayton L. Estep, Sepulveda, both of Calif., assignors to Trans-Med Corporation, San Diego, Calif.

Filed May 3, 1979, Ser. No. 35,728
Int. Cl.[3] A61B 5/14, 10/00
U.S. Cl. 128—766 3 Claims



1. A diagnostic specimen collector consisting of:

an elongated hollow body open at one end and closed at the opposite end with a single orifice in said closed end;

a plunger having sealing means on one end which is slidably inserted into, and in sealing relationship with, said body to vary the interior volume of said body;

a closure for said closed end orifice consisting of a onepiece cap having an end wall with a skirt extension exteriorly mounted to encompass said closed end concentrically and rotatable thereabout and a nipple to receive compatible fittings of specimen taking medical devices extending outwardly from the outer surface of said end wall and an orifice in said closure passing axially through said nipple and said end wall, said closure being rotatable from a first position in which both orifices are out of communication and said closed end orifice is in a sealed condition to a second position in which both orifices are in sealed communication for the passage of a specimen upon movement of said plunger and back to said first position after passage of said specimen;

and an O-ring seal for said closed end orifice positioned concentrically with reference to said orifice in an annular groove on the outer surface of said closed end, a portion of said O-ring extending above said closed end outer surface to create a friction-free space between said outer surface and the inner surface of said end wall except for a moving area of sealing contact between said ring portion and the inner surface of the end wall, said ring portion providing a bearing surface for said rotation of said closure.

4,320,771

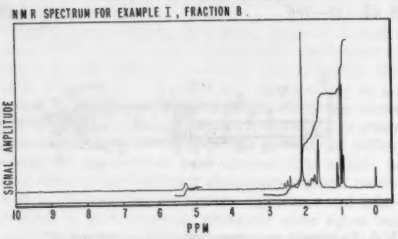
USE OF 2-OXABICYCLOOCTANE DERIVATIVE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCOS AND SMOKING TOBACCO ARTICLES

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 77,539, Sep. 21, 1979, Pat. No. 4,269,862, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Aug. 7, 1980, Ser. No. 176,112
Int. Cl.[3] A24B 15/30
U.S. Cl. 131—276 3 Claims

1. A process for augmenting or enhancing the organoleptic properties of a smoking tobacco comprising the step of adding

to said smoking tobacco an aroma or taste augmenting or enhancing quantity of 1,3,5,5-tetramethyl-2-oxabicyclo-[2.2.2]octane having the structure:



4,320,772

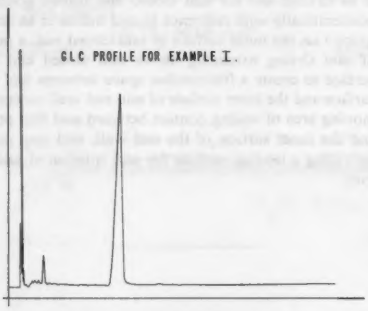
METHYL SUBSTITUTED OXOBICYCLO-4,4,0-DECANE DERIVATIVES, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Takao Yoshida, West Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

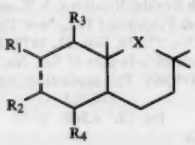
Filed Aug. 29, 1980, Ser. No. 182,451

Int. Cl.³ A24B *5/30*

U.S. Cl. 131—276 **4 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with smoking tobacco an aroma or taste augmenting or enhancing quantity of at least one oxobicyclo compound defined according to the structure:



wherein X represents the moiety:

or

wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; wherein R_1, R_2, R_3 and R_4 is each selected from the group consisting of hydrogen and methyl; wherein R_5 is hydrogen; wherein R_6 represents hydrogen or methyl; with the provisos that (i) at least three of R_1, R_2, R_3 and R_4 represent hydrogen and (ii) that when the dashed line is a carbon-carbon single bond and X is the moiety:

then one of R_1, R_2, R_3 or R_4 is methyl and the others of R_1, R_2, R_3 or R_4 is hydrogen.

4,320,773

METHOD AND APPARATUS FOR TREATING WRAPPING MATERIAL FOR CIGARETTES OR THE LIKE

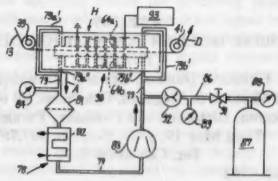
Peter Pinck, Gross-Hansdorf; Uwe Heitmann, Hamburg; Anton Baier, Wentorf, and Adolf Helms, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,687

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934044

Int. Cl.³ A24C *5/60*

U.S. Cl. 131—281 **23 Claims**

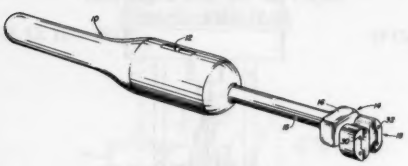


1. A method of treating wrapping material for rod-shaped articles which constitute or form part of smokers' products in a machine for the manufacture and/or processing of such products, comprising the steps of establishing at least one spark gap between first and second electrodes; introducing the wrapping material into said spark gap whereby the sparks between the first and second electrodes perforate the wrapping material and entail the development of dust particles and ozone; establishing an endless path which includes the spark gap and is at least substantially sealed from the surrounding atmosphere; filling said path with a gaseous fluid which counteracts the development of ozone; circulating the gaseous fluid along said path whereby the fluid entrains the particles of dust from the region of said gap; and intercepting the entrained particles of dust in a portion of said path which is located downstream of said gap, as considered in the direction of circulation of gaseous fluid along said path, so that the fluid which flows from said portion of said path toward said spark gap is at least substantially free of dust particles.

4,320,774
MECHANICAL TOOTHBRUSH

Kenneth G. Rogers, 1001 Waverly Dr., Longwood, Fla. 32750

Filed Apr. 23, 1980, Ser. No. 143,094
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 A 26 Claims

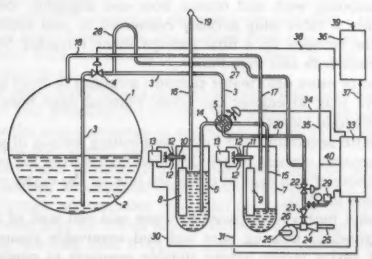


1. A mechanical toothbrush comprising:
a. means for rotating a drive shaft;
b. a first loop-shaped belt brush; and
c. a second loop-shaped belt brush; and
d. brush drive means coupled to said rotating means and to said first and second belt brushes for maintaining said first and second belt brushes in fore and aft alignment and in an oval configuration and for causing said drive shaft to rotate said first and second belt brushes in opposing directions.

4,320,775
LIQUID METERING UNIT RESPONSIVE TO THE WEIGHT OF THE METERED LIQUID

William Stirling, Wirral, England, and Robert L. Peres, Neuilly, France, assignors to The Associated Octel Company Limited, London, England and Octel S.A., Paris, France

Filed Feb. 4, 1980, Ser. No. 118,235
Claims priority, application France, Feb. 5, 1979, 79 02882
Int. Cl.³ G05D *11/02*
U.S. Cl. 137—3 14 Claims

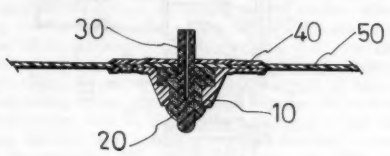


1. In a process for the control of liquid flow at a desired low flow rate, which comprises alternately filling and emptying two fixed reservoirs, the one reservoir being filled from a supply of the said liquid while the other is being emptied through a flow control valve to an outlet pipe, the flow of liquid to and from said reservoirs being automatically switched from one reservoir to the other as the liquid level in the reservoir being emptied sinks to a predetermined level, the improvement which comprises:
(a) continuously sensing the change of apparent weight of an elongated solid element suspended in the reservoir being emptied, said element having a specific gravity greater than said liquid and a length that is greater than the variation of liquid level in the said reservoir;
(b) generating an analogue electrical signal proportional to the sensed apparent weight of said solid element;
(c) converting the analogue signal to a digital flow signal proportional to the rate of change of said analogue signal and thus proportional to the rate of mass discharge from the reservoir being empltied;
(d) comparing the digital flow signal with a digital demand signal representative of a desired mass flow rate;
(e) automatically adjusting the setting of the flow control valve in response to any difference between the digital flow signal and said demand signal, thereby to increase or decrease the mass flow rate from the reservoir being emptied, as may be necessary to achieve equalization of said digital flow signal and said demand signal;
(f) continuously monitoring said analogue signal;
(g) automatically switching the discharge from one reservoir to the other when said analogue signal reaches a predetermined level; and
(h) immediately prior to the switch over from one reservoir to the other, memorizing the frequency of said digital signal as existing immediately prior to the change over of liquid discharge from one reservoir to the other, generating a substitute digital flow signal having a frequency equal to that of the memorized signal, and during the period of change over using that substitute digital flow signal in step (d) for comparison with said demand signal, thereby to maintain the setting of the flow control valve unchanged during the period of the change over.

4,320,776
CONSTRUCTION OF THE BALL BLADDER ORIFICE

Wen H. Yang, P.O. Box 562, Kaohsiung, Taiwan (800)

Filed Dec. 20, 1979, Ser. No. 105,592
Int. Cl.³ A63B *41/00*; F16K *15/20*
U.S. Cl. 137—223 1 Claim



1. A ball bladder orifice comprising:
an orifice saddle having a hollow body portion and a fringe portion extending radially from the top end of said body portion, the hollow body portion having two inside diameters, the larger diameter being closer to the fringe portion, the upper surface of said fringe portion being adapted for adhering to the inner surface of the ball bladder;
an orifice set adapted for insertion into said orifice saddle, said orifice set having a head portion, a neck portion, and a rounded hook portion, said head portion having a diameter and height substantially the same as the larger diameter portion in said orifice saddle, the upper surface of said head portion adapted for adhering to the inner surface of the ball bladder, said neck portion having a diameter and height substantially the same as the smaller diameter portion in said orifice saddle, said hook portion having a diameter greater than said neck portion so that said hook portion protrudes out of the lower end of the orifice saddle, a hollow shaft extending longitudinally through the entire length of said orifice set, said shaft having an enlarged diameter in the head portion of said orifice set;
an inset tube adapted for insertion into said orifice set, said tube having a radially extending flange on the outer periphery thereof, said inset tube being provided with a needle hole along the longitudinal axis thereof, the hole having two diameters, a larger diameter for the top portion of the tube and a fissure in the bottom portion of the tube, the diameter of the radially extending flange of the inset tube being substantially the same as the enlarged diameter of the head portion of said orifice set, the diameter of said inset tube being substantially the same as the

diameter of the hollow shaft in said orifice set, the lower end of said tube extending out of the lower end of said orifice saddle;

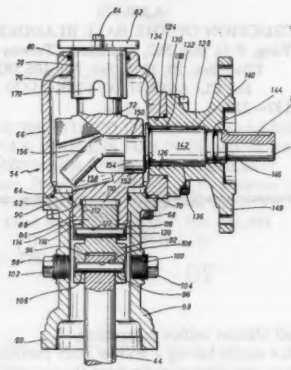
and a strength washer having a centrally located aperture through which the top portion of the inset tube extends, the bottom surface of said washer adapted for adhering to the outside surface of the ball bladder.

4,320,777

ACTUATOR MECHANISM FOR LIFT-TURN VALVES

Jerry B. Tomlin, Sugar Land, and James N. Strickland, Houston, both of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Jun. 16, 1980, Ser. No. 159,513
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **16 Claims**



1. A valve actuator mechanism for lift-turn type valves wherein linear and rotary components of movement are induced to a valve stem during each opening or closing cycle of operation to cause unseating, rotation and reseating of a valve element, said valve actuator mechanism comprising:

an actuator element being formed to define an actuator cavity having crank energized cam surface means defined thereby and being formed to define eccentric energized cam surface means, said actuator element being adapted for connection to said valve stem;

an actuator shaft being positioned for rotation relative to said actuator element;

a crank element extending from said actuator shaft and adapted for camming engagement with said crank energized cam surface means to induce rotary motion to said actuator element upon rotation of said actuator shaft;

an eccentric element being provided on said actuator shaft and adapted for camming engagement with said eccentric energized cam surface means to induce linear motion to said actuator element upon rotation of said actuator shaft;

first guide means being provided on said actuator element; and

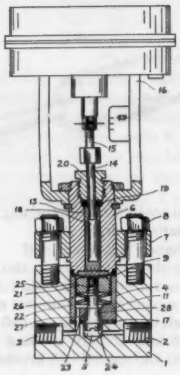
second guide means being interengaged with said first guide means during linear motion of said actuator element to restrain said actuator element against rotary motion during said linear motion thereof.

4,320,778

MINUTE FLOW REGULATING VALVE

Hans D. Baumann, P.O. Box 471, Rye, N.H. 03870

Continuation-in-part of Ser. No. 146,630, May 5, 1980, Pat. No. 4,278,234. This application Mar. 9, 1981, Ser. No. 241,593
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—454.6 **6 Claims**



1. Apparatus for controllably restricting the flow of fluid there through which comprises:

(a) a housing having inlet and outlet ports, a longitudinal bore having one terminating end wall portion and at least one additional port opening connecting externally with said longitudinal bore and through said end wall;

(b) means for creating frictional flow path being part of a removable element which is located within said longitudinal housing bore and having a lower terminating surface;

(c) said removable element comprising a cage having a central bore incorporating within a slidable piston member, said cage having a second lower reduced bore communicating with said central bore and engaging therewithin a valve plug suitably connected to said slidable piston to open up a flow passage when retracted from contact with said cage bore;

(d) one or more deformable elements arranged to force said valve plug to engage the lower reduced cage bore to effect tight closure;

(e) a bore penetrating the lower terminating surface of said removable element to provide fluid access from the central bore of said cage to either the inlet or the outlet port of said housing;

(f) gasket means interspaced between said end wall of the longitudinal housing bore and said removable element, said gasket means having suitable openings to conduct fluid to and from, but sealing against, an area occupied by said valve plug and said bore connecting to either inlet or outlet port;

(g) closure member suitably fastened to the opening of said longitudinal bore of the housing to effectively retain said removable element and cover the latter, and having an opening extending through the length of said closure member retaining hydraulic fluid therein;

(h) flexible diaphragm means interspaced between said closure member and said means for creating a frictional flow path;

(i) hydraulic means to effectively position said slidable piston together with said valve plug, said hydraulic means includes external actuating device having a stem-like extension penetrating slidingly into the said hydraulic fluid-filled opening to allow volumetric displacement of fluid to in turn oppose the force of said deformable elements to effect the position of said valve plug, wherein the cross-

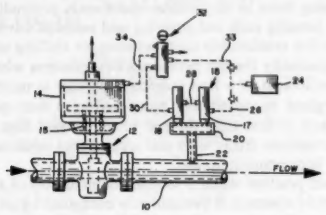
sectional area of said stem-like extension is significantly smaller than the cross-sectional area of said piston.

4,320,779

PUSH-TYPE CONTROL VALVE FOR FLUID ACTUATOR

Clifford M. Peters, Longview, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Aug. 8, 1980, Ser. No. 176,366
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—492.5 15 Claims



13. A system for controlling the flow of fluid through a main flowline in response to pressure changes of fluid therein outside of a predetermined pressure range comprising:

a shut-off valve connected to the main flowline for moving between an open and closed position to permit or prevent flow therethrough, respectively;

an actuator operatively connected to said shut-off valve for moving said shut-off valve to the open position or closed position;

a high-low pilot valve assembly connected to the main flowline for directly sensing fluid pressure in the main flowline and being in either an open position when the fluid within the main flowline is within the predetermined pressure range or in a closed position when fluid within the main flowline is outside of the predetermined pressure range;

a pressurized actuator fluid source connected to said high-low pilot assembly;

a control valve having an elongate body including a longitudinal bore therein, said longitudinal bore having an enlarged bore portion defining a piston chamber in said elongate valve body;

said valve body having an actuator fluid inlet port connected to said pressurized actuator fluid source, an actuator fluid outlet port connected to said actuator, and an actuator fluid vent port vented to atmosphere;

a slide valve mounted in said longitudinal bore for movement between an unseated position for directing fluid received through said actuator fluid inlet port to said actuator fluid outlet port for travel to said actuator and a seated position for bleeding fluid from said actuator through said actuator fluid vent port;

a biasing means, mounted in said piston chamber, for biasing said slide valve to the seated position;

said elongate valve body having a pilot port connected to said high-low pilot valve assembly by a pilot line to sense the fluid pressure in the pilot line;

a piston carried in said piston chamber on an inner end of said slide valve, said piston presenting an outwardly facing pressure face for receiving pressurized fluid from said pilot port to hold said slide valve in the unseated position;

a fluid directing means, in said slide valve, for directing fluid from said pilot port to said outwardly facing pressure face when said slide valve is in the unseated position and for venting fluid from said outwardly facing pressure face when said slide valve is in the seated position; and

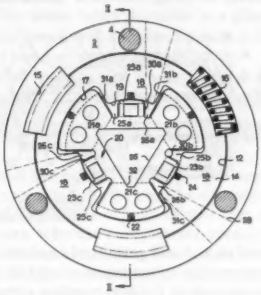
said slide valve having a pilot blocking portion positioned along the length of said slide valve so that said pilot blocking portion abuts said pilot port under all conditions of operation when said slide valve is in the seated position so as to block fluid pressure from the pilot line from acting on said outwardly facing pressure face of said piston.

4,320,780

HYDRAULIC CONTROL VALVE

Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Oct. 27, 1980, Ser. No. 200,680
Claims priority, application Spain, Nov. 1, 1979, 485.604
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—625.21 3 Claims



1. Hydraulic control valve, of the type providing an output pressure which is a function of the displacement of a moving valve member or of the drive torque applied thereto, which moving member is formed by a rotor (**20**) rotatable around an axis and having at least one radially extending short arm (**23***a*) and one radially extending long arm (**21***a*), the ends of which slidingly engage respective cylindrical surfaces (**19, 17**) having a corresponding radius, of a disc-shaped chamber, the surfaces of which engage with the rotor surfaces defining at least one working chamber (**25***a*) connected with the hydraulic device (C) to be controlled, a hydraulic fluid inlet port (**30***a*) and outlet port (**31***a*) being disposed on the chamber base surfaces, the first one mating with the short arm and the second one with the long arm so that in operation there is produced a reaction on the surface of the long arm adjacent the chamber, characterized essentially in that the disc-shaped chamber is formed in a member (**14**) rotatably mounted around the axis of the rotor in a cavity formed in the valve body, said member being held in the rest position of the valve by resilient means (**16**) and being provided with stop means (**18**) engaging mating parts (**21**) of the rotor when the latter is moved from the rest position thereof, the arrangement being such that the rotor stroke to the stop means corresponds to a first gradient of the valve characteristic and the loading of the resilient means, which are compressed from this stop position onwards, corresponds to the gradient of a second part of the characteristic.

4,320,781

THREE-WAY ELECTRICALLY-ACTUATED HYDRAULIC DISTRIBUTOR

Jean M. Bouvet, Boulogne-Billancourt, and Philippe Quemerais, Thurins, both of France, assignors to Regie Nationale des Usines Renault, Billancourt and Renault Vehicules, Lyons, both of, France

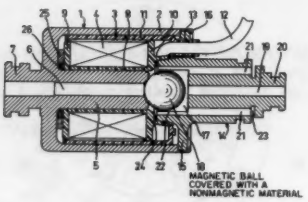
Filed Oct. 11, 1979, Ser. No. 83,691
Claims priority, application France, Oct. 16, 1978, 78 29442
Int. Cl.³ F15B *13/044*
U.S. Cl. 137—625.65 6 Claims

1. A 3-way electromagnetic valve for controlling the flow of a fluid comprising:

a first member made of magnetic material including a central core and an external casing, said core having an input passage therethrough for the flow of fluid, said external

casing defining a cavity for enclosing an electromagnetic coil, a first coupling connector means leading to said passage and located at one end of said central core, a valve seat at the free end of said central core,

a second member made of magnetic material and having a radial flange cooperating with said external casing portion to close said cavity, said second member including an open ball-enclosing cavity, a central conduit constituting a first output for the flow of fluid and a plurality of peripheral conduits constituting a second output for the flow of fluid, said peripheral conduits entering said ball-enclosing cavity at its periphery and communicating with said central conduit through said cavity, said second member having second coupling connector means leading to said



central conduit and said peripheral conduits, said second coupling connector means being located at the opposite end of the valve from the first coupling connector means and

a magnetic ball located within said cavity, said ball being movable in response to energization of the electromagnetic coil to a position where it contacts said valve seat and closes said input passage, the dimensions of said ball-enclosing cavity being such that said central conduit is closed by said ball when the electromagnetic coil is deenergized and that said peripheral conduits cannot be obstructed by said ball in any position whereby said second output in said second member is connected either with said input in said first member or with said first output in said second member.

4,320,782

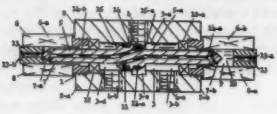
UNIVERSAL MOMENTARY CONTACT DIVERTER

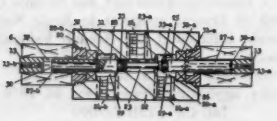
Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 9,678, Feb. 5, 1979, Pat. No. 4,231,399. This application Aug. 22, 1980, Ser. No. 181,006

Int. Cl.³ F16K *31/06*

U.S. Cl. 137—625.65 **10 Claims**





1. An universal momentary contact diverter comprising:

an elongated valve housing with a bore passing therethrough between first and second housing ends each closed by an identical electrical solenoid operator having solenoid cavities thereof forming an extension of said bore,

including a fluid supply, receiver and exhaust port means incorporated in said housing with a first port entering said bore perpendicularly through a housing wall substantially midway between said housing ends while each second and third housing ports enter said bore perpendicularly and are spaced a short distance away from said first port along the length of said housing toward said first and seconds ends thereof, and

an axially movable elongated valve spool placed inside said housing bore so as to have spool ends protruding from said housing ends and entering said solenoid cavities in an operable relationship therebetween for shifting said spool magnetically therein between a first position when a first solenoid coil of a first solenoid operator is momentarily energized by an electric pulse pulling a first spool end towards a first stop thereof to allow said first port to communicate freely with said second port while said third port is disconnected, and

a second position when a second solenoid coil of a second solenoid operator is momentarily energized by an electric pulse pulling a second spool end into a direction opposite the first direction towards a second stop thereof to allow said first port to communicate freely with said third port while said second port is disconnected, and vice versa,

including a set of two movable seals permanently secured on said spool substantially central thereto at equal distance therebetween adjacent said first port, and a set of two stationary seals inside the ends of said bore of said housing adjacent said operators.

4,320,783

STABILIZED HOSE ASSEMBLY FOR TRANSMITTING FLUID

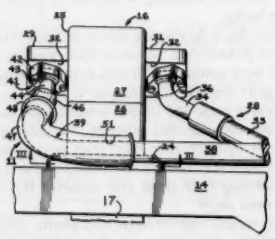
James G. Neal, and Warren J. Stafford, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00040, § 371 Date Jan. 17, 1980, § 102(e) Date Jan. 17, 1980, PCT Pub. No. WO81/02055, PCT Pub. Date Jul. 23, 1981.

PCT Filed Jan. 17, 1980, Ser. No. 166,261

Int. Cl.³ F16L *7/00*

U.S. Cl. 138—110 **9 Claims**



1. In a fluid system **(11)** having a fluid transmitting component **(16)** and a flexible hose **(38)** including a curved portion **(39)** and including an end **(46)** connected to said fluid transmitting component **(16)**, the improvement comprising:

a curved rigid sleeve member **(47)** disposed in a fixed position relative to said end **(46)** of said hose **(38)** and said fluid transmitting component **(16)** and having a curvilinear inside passage **(51)** through which said curved portion **(39)** of said hose **(38)** extends, said curvilinear inside passage **(51)** having a diameter greater than the diameter of said hose **(38)** and being of a construction sufficient for enabling limited movements within said curved sleeve member **(47)** of said curved portion **(39)** of said hose **(38)** relative to said sleeve member **(47)** and said fluid transmitting component **(16)** while maintaining said curved portion

(39) of said hose (38) within a predetermined range of curvatures.

4,320,784

MOUNTING FOR A TENSION BEAM

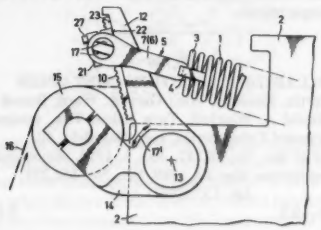
Eberhard Seifert, Rickenbach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 26, 1980, Ser. No. 124,731

Claims priority, application Switzerland, Mar. 1, 1979, 2032/79

Int. Cl.³ D03D *49/22*

U.S. Cl. 139—114 13 Claims



1. A mounting for a tension beam of a weaving machine, said mounting comprising

a pivotally mounted two arm tension lever having one arm for receiving a tension beam thereon;

a serration mounted on a side of a solid second arm of said tension lever;

an accumulator for generating a tension force in said lever;

a tooth element between said accumulator and said second arm and steplessly cooperating with said serration to permit adjustment of a torque exerted by said accumulator on a tension beam mounted on said one arm of said tension lever without bringing the tension beam into a tensionless position; and

releaseable clamping means to restrain movement of said tooth element relative to said serration.

4,320,785

MECHANISM ON SHUTTLELESS LOOMS FOR THE TRANSFER OF THE END OF THE WEFT YARN

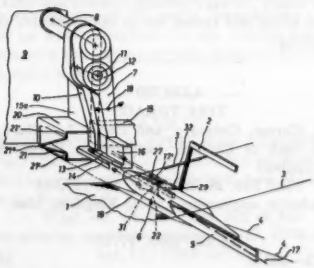
Rudolf Zwiener, Arbon, Switzerland, assignor to Adolph Saurer Limited, Arbon, Switzerland

Filed Feb. 4, 1980, Ser. No. 118,641

Claims priority, application Switzerland, Feb. 5, 1979, 1119/79

Int. Cl.³ D03D *47/14*

U.S. Cl. 139—444 7 Claims



1. A weft yarn transfer mechanism for shuttleless looms of the type having a weft inserter on which a forklike nose-gripper is arranged having a pair of spaced horns, a yarn holder carried by one horn of the nose-gripper capable of being opened, a thrust-piece carried by said nose-gripper for opening said yarn holder, a yarn guide carried on the other horn of the nose-gripper, said weft yarn being held between said yarn holder and said yarn guide transverse to the direction of weft insertion, and a second yarn holder having jaws which press together under resilient action and capable of being opened wherein said second holder comprises:

carrier means mounted on a machine frame of said loom carrying said second yarn holder;

said second yarn holder having first and second yarn gripping jaws;

said carrier means being pivotable in a plane transverse to the direction of weft insertion between a rear position and a front position;

said first jaw lying behind a path of travel of said weft yarn during weft insertion when said carrier means is in said rear position;

said second jaw being rotatably carried by said carrier means,

said second jaw bearing against a fixed stop when said carrier means is in said rear position wherein said second jaw occupies a position in front of said path of travel of said weft yarn, whereby said jaws are opened;

said carrier means including a stop-face oriented generally perpendicular to its path of pivotal motion, said stop face contacting said thrust-piece of said yarn holder of said nose-gripper to open said yarn holder.

4,320,786

MEASURING DEVICE FOR THREAD AND A METHOD OF ADJUSTING THE LENGTH OF A TRAVELLING THREAD

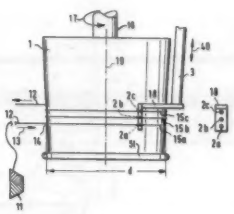
Karl Popp, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 26, 1980, Ser. No. 124,714

Claims priority, application Switzerland, Mar. 1, 1979, 2033/79

Int. Cl.³ D03D *47/34*

U.S. Cl. 139—452 8 Claims



1. A measuring device for thread, said device comprising

a conical winding body mounted about a longitudinal axis of rotation and having an outer circumferential surface for receiving a plurality of thread windings thereon;

a thread guide having a plurality of guide surfaces disposed in spaced relation to said circumferential surface along a plane oblique to and at a slope opposite to the slope of said circumferential surface, each said guide surface being disposed to receive a respective thread winding therein; and

means for adjusting said thread guide longitudinally along said plane relative to said winding body to adjust the length of a thread on said circumferential surface.

4,320,787

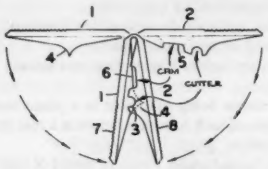
BLOOD SEGMENT PROCESSOR

John J. McMorrow, 55 Florence Ave., Oyster Bay, N.Y. 11771

Continuation-in-part of Ser. No. 78,050, Sep. 24, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,852

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—98 3 Claims



1. Means to release fluid from a segmented plastic tube into a container comprising:

a hinged member having first and second arms,

a cutter mounted on the first arm a predetermined distance from the hinge,

the interior wall of the second arm being shaped to position the segmented tube so that it is cut by the cutter at a central point on the tubular member, when the arms are squeezed together,

whereby a segmented plastic tube containing fluid may be inserted in said hinged member and cut by the cutter to thereby release the fluid,

a cam surface positioned on one arm,

the interior wall of the other arm being shaped so that the cam surface will squeeze the tube so that the contents of the tube may be squeezed out.

4,320,788

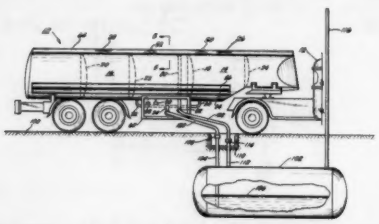
APPARATUS FOR THE BULK DELIVERY OF VOLATILE LIQUIDS

Frank K. Lord, Huntington Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Division of Ser. No. 589,585, Jun. 23, 1975, abandoned, and a continuation-in-part of Ser. No. 284,662, Aug. 29, 1972, abandoned. This application Sep. 10, 1979, Ser. No. 73,903

Int. Cl.³ B65B *3/18;* F16K *24/00;* F17C *13/00*

U.S. Cl. 141—290 9 Claims



1. An apparatus for delivering a volatile liquid to a receiving tank, comprising:

a mobile delivery vessel having a delivery tank containing one or more compartments for the bulk storage of said volatile liquid;

liquid outlet means fluid-tightly connected to the bottom of each of said compartments and adapted to withdraw said liquid from said compartments;

one or more remotely operated liquid outlet valves operably connected to said liquid outlet means, each of said liquid outlet valves being adapted to selectively control the flow of said liquid from the corresponding one of said compartments;

vapor inlet means fluid-tightly connected to the top of each of said compartments and adapted to introduce vapor into said compartments;

one or more remotely controlled vapor inlet valves operably connected to said vapor inlet means, each of said vapor inlet valves being adapted to selectively control the flow of vapor into the corresponding one of said compartments; and

valve interlock means mounted on said mobile delivery vessel and adapted to interlock the opening and closing of the liquid outlet valve and the vapor inlet valve of each of said compartments.

4,320,789

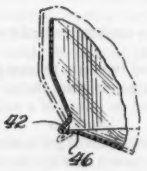
COLLAPSIBLE SOLUTION CONTAINER

Jerry D. Martin, Kenosha, Wis.; Gary A. Ward, Round Lake, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 28,152, Apr. 9, 1979, abandoned. This application May 19, 1980, Ser. No. 151,355

Int. Cl.³ B65D *1/02*

U.S. Cl. 150—0.5 5 Claims



1. In a molded, collapsible solution container, which container defines a body portion having an integral neck portion and a relatively stiff shoulder portion at one end thereof, said container being sealed at its end opposite said one end, said shoulder portion including a peripheral portion circumscribing said body portion, a pair of gusset portions defined in said body portion adjacent said peripheral portion at circumferentially opposite sides of said peripheral portion, said shoulder portion extending outwardly from said neck portion and also extending axially rearwardly away from said neck portion, the improvement comprising:

outer sections of said peripheral portion adjacent the gusset portions normally extending in a plane perpendicular to the longitudinal axis of said container, each said outer section being connected to the remainder of said shoulder portion by a crease line to define an obtuse angle with the remainder of said shoulder portion, and being flexible to permit axially forward bending toward said neck of said sections about said crease line as said container collapses by draining.

4,320,790

TIRE TREADS

Michael R. Corner, Coventry, and Barry J. Allbert, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England

Filed Feb. 28, 1980, Ser. No. 125,583

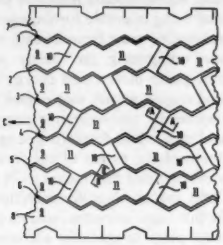
Claims priority, application United Kingdom, Mar. 7, 1979, 08019/79

Int. Cl.³ B60C *11/04*

U.S. Cl. 152—209 R 15 Claims

1. A tire tread for a heavy vehicle comprising at least two circumferentially extending grooves which divide the full width of the tread into at least three circumferentially extending ribs and a series of spaced apart transversely extending slots

of a width wider than said circumferential grooves such that they do not close when they are in the contact patch and which subdivide at least one rib into discrete tread elements, the slots thus providing a plurality of road gripping edges for good wet grip; the grooves having a zig-zag configuration comprising



short straight portions at an actue angle in the range of 10°–40° to the longitudinal direction of the tread so as to inter-engage adjacent tread elements and being shaped so that in use on a vheicle when the tire thread is in the contact patch the opposed sides of the ribs engage to resist relative movement of the tread elements and said transverse slots remain open.

4,320,791

PNEUMATIC TIRE BEAD COMPRISING HIGH MODULUS FIBERS AND POLYURETHANE MATRIX

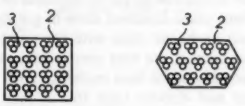
Katsuhiko Fujii, Niiza; Minoru Ueda, Osaka, and Hiroshi Minekawa, Sennan, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and The Ohtsu Tire & Rubber Co., Ltd., Osaka, both of, Japan

Filed Sep. 5, 1980, Ser. No. 184,306

Claims priority, application Japan, Sep. 12, 1979, 54-117753

Int. Cl.³ B60C *15/04;* **B29H** *17/32*

U.S. Cl. 152—362 R **3 Claims**



1. A pneumatic tire including as a component thereof a bead member comprising a slender bead element in the form of an untwisted cord made solely of an organic fiber having a high modulus of at least 10^5 kg/cm^2, and a matrix phase made from a liquid thermosetting polyurethane resin cured before the bead member is incorporated into the tire to form a composite body together with the fiber, the matrix phase having a modulus of 50 to 10^6 kg/cm^2 after curing, the cured composite body of the bead element and the matrix phase having a stress of at least 200 kg when stretched 1%, the volume fraction of the bead element in the composite body being 0.2 to 0.8 relative to the composite body.

4,320,792

DEVICE FOR ADJUSTING THE HEIGHT AND PROTRUSION OF A ROLLABLE SUN-BLIND

Marcello Licciardi, and Stefano Licciardi, both of Via Taddeo da Sessa 12, Rome, Italy

Filed Jun. 14, 1979, Ser. No. 48,343

Claims priority, application Italy, Jun. 19, 1978, 49934 A/78

Int. Cl.³ E04F *10/06*

U.S. Cl. 160—74 **12 Claims**

1. In a sun-blind suspension construction, in combination,

reel means operable for rolling up, and, dispensing the sun-blind;

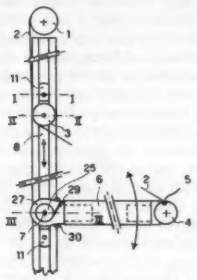
engaging means operable for engaging the free end of the sun-blind;

projecting means supporting said engaging means;

pivot means pivotably supporting said projecting means, and

elevator means disposed intermediate said pivot means and said reel means and operable for positioning said projecting means at variable positions in relation to said reel means, including

longitudinal guide means spaced at a predetermined distance from said reel means;



moving means movable along said guide means, said projecting means being connected near one end thereof through said pivot means to said moving means; and

interlocking means including pressure adjustment means releasably interlocking said moving means with said guide means at an adjustable and substantially uniform pressure at any desired position along the length of said guide means, thereby arresting said one end of said projecting means at any selected position of elevation.

4,320,793

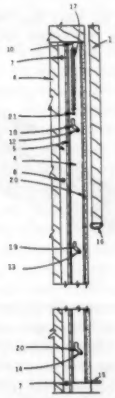
OUTWARD THRUSTING DOOR WEATHERSTRIP

Charles Lindbergh, 10 S. Basilica, Charleston, S.C. 29406

Filed Mar. 10, 1980, Ser. No. 128,532

Int. Cl.³ E05D *15/16;* **E06B** *7/20*

U.S. Cl. 160—201 **4 Claims**



1. A weatherstripping arrangement for a sliding closure comprising a fixed jamb extending along the path of movement of the sliding closure near one edge thereof, a shell fixed to said jamb and extending lengthwise thereof and having a longitudinal opening facing the plane of said closure, a weatherstrip rail movably held within the shell and being substantially coexten-

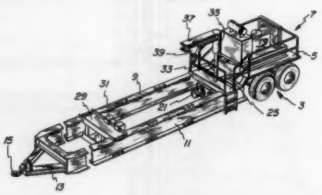
sive lengthwise with the jamb and shell, a compressible weatherstrip element attached to the rail and being substantially coextensive lengthwise with the rail and adapted in an inactive position to lie wholly inside of the shell and in an active position to project through the opening of the shell and outside of the shell to abut the opposing surface of the closure, spring means connected with the rail and biasing the rail and weatherstrip element to said inactive position inside of the shell, a substantially rigid lateral projecting element on the rail adjacent to one end of the rail in the path of movement of the leading edge of the sliding closure and adapted to be engaged by the leading edge when the sliding closure is approaching a fully closed position, at least a pair of fixed pins on the shell across the longitudinal axis of the rail and shell and within the opening of the shell and being spaced apart longitudinally of the shell, at least a pair of coacting cam slots in the rail receiving said fixed pins therethrough cammingly and having portions extending longitudinally of the rail and shell and portions extending at an oblique angle to the longitudinal axis of the rail and shell and toward the weatherstrip element, and a compressible resilient seal on the leading edge of the sliding closure for abutment with an opposing surface when the sliding closure is in a fully closed position, said longitudinal slot portions enabling overtravel of the sliding closure beyond a normal fully closed position followed by slight return travel to the normal fully closed position without inducing sliding motion of the weatherstrip element relative to the closure and without loss of sealing contact between the weatherstrip element and closure, and said fixed pins being located substantially at junctures of the longitudinally extending and oblique angle portions of the cam slots when the sliding closure is in the normal fully closed position, said pins moving substantially to the ends of the longitudinal cam slot portions when the closure is in the overtravel position and moving substantially to the ends of the oblique angle cam slot portions when the rail and weatherstrip element are in the biased inactive position.

4,320,794

KUPIEC'S MOBILE INGOT EXTRACTOR

Edward J. Kupiec, Sr., 724 Lafayette St., Utica, N.Y. 13502, assignor to Edward J. Kupiec, Sr.; Helen Kupiec; Edward J. Kupiec, Jr., all of Utica; Robert J. Kupiec, Barneveld; Peter M. Kupiec, Barneveld; Christopher P. Kupiec, Barneveld and Roberta H. Wessendorf, Guilderland, all of, N.Y., a part interest

Filed Apr. 14, 1981, Ser. No. 254,107
Int. Cl.³ B22D *29/06*
U.S. Cl. 164—406 **6 Claims**



1. A mobile ingot extractor for use in removing a stuck ingot from its mold, said mobile ingot extractor comprising a wheeled trailer having a frame, longitudinal frame members, a drawbar frame, coupling means, cross-members, stops, ram means, self-containment means and spacer plugs; said longitudinal frame members being carried at one of their common ends by said wheeled-trailer frame and at their other common ends by said drawbar frame, said drawbar frame carrying said coupling means, said coupling means operatively connecting said mobile ingot extractor to a prime mover means for towing and positioning said mobile ingot extractor, said longitudinal frame members carrying said cross-members, said cross-members carrying said stops and ram means, said cross-members being relatively adjustable therebetween along the longitudinal axes of said longitudinal frame members to spatially accommodate molds of different lengths, said mold being disposed between said stop means and ram means for operative engagement by said ram means with said stuck ingot of said mold, said stops being movable laterally and radially on one of said cross-members to spatially accommodate molds of different diameters, said ram means being operable for engagement with said stuck ingot for removal of same from its said mold, said self-containment means comprising an energy supply, engine means and hydraulic pump means, said energy supply operating and running said engine means, said engine means driving said hydraulic pump means, said hydraulic pump means reciprocably driving said ram means forward to engage and move said stuck ingot forward the extent of the forward travel of said ram means or driving said ram means to its inoperative or starting position, and spacer plugs for insertion into a mold received by said mobile ingot extractor, said mold successively receiving said spacer plugs to spatially accommodate the resulting spaces caused by forward movements of said ingot through said mold corresponding to the successive forward travels of said ram means.

4,320,795

PROCESS FOR HEAT TRANSFER WITH DILUTE PHASE FLUIDIZED BED

John E. Gwyn, Katy, and Scott C. Roberts, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 593,403, Jul. 7, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,197 The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.³ C10B *49/22, 53/06;* F28D *13/00*
U.S. Cl. 165—1 **4 Claims**

1. Process for the transfer of heat between solid materials comprising,

providing a relatively hot particulate heat carrier,

countercurrently contacting a solid material subdivided to a particle size fluidizable in gas in the form of an upwardly moving dilute phase fluidized mass in gas in a vertically-oriented heat exchange zone with the relatively hot particulate heat carrier, the heat carrier being introduced in the upper portion of the heat exchange zone and having a particle size and density such that it falls through the dilute phase fluidized mass at a substantially uniform rate, and collects in the lower portion of the heat exchange zone as a relatively cool particulate heat carrier, the contacting producing a solid material at elevated temperature, removing the relatively cool heat carrier, and removing the solid material at elevated temperature from the upper portion of the heat exchange zone.

4,320,796

GRANULAR BED AIR HEATER

Richard D. Smith, 2415 South Court, Palo Alto, Calif. 94301

Filed Jan. 19, 1979, Ser. No. 4,819
Int. Cl.³ F28D *3/14*
U.S. Cl. 165—1 **26 Claims**

20. A method for transferring heat from a hot fluid stream which can contain water vapor, solid particulate and other condensable vapors and the like to a media and for transferring heat from the media to another fluid stream comprising the steps of:

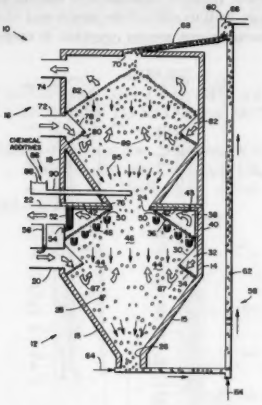
passing the hot fluid stream through a first heat exchanger having a first bed of moving media so that the hot fluid stream heats the media;

condensing and removing the water vapor and other condensable vapors;

passing the heated media into a second heat exchanger;

passing the another fluid stream into the heat media in the

second heat exchanger to heat the another fluid stream; and,



adding chemical additions to the media prior to introducing the media into the first heat exchanger to suppress gaseous pollutants.

4,320,797

CONTROL APPARATUS FOR AIR CONDITIONER OF AUTOMOBILE

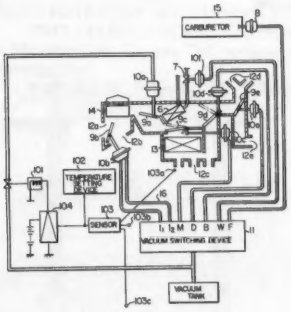
Tsuneo Kagohata, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 106,084, Dec. 21, 1979, abandoned, which is a continuation of Ser. No. 913,686, Jun. 8, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,149

Claims priority, application Japan, Jun. 10, 1977, 52/67943

Int. Cl.³ F28F *27/00*

U.S. Cl. 165—12 **13 Claims**



1. In an air conditioner of an automobile having a heater core and an evaporator core, a control apparatus comprising:

duct means in which said cores are arranged;

a plurality of doors arranged in said duct means, including a door for switching flow path of air flowing in said cores, a door for selecting inlet port of air and a door for selecting exit of cool/warm air flowing from said cores;

control elements constituting, along with said doors, said air conditioner;

a plurality of vacuum actuators for actuating said doors and said control elements;

electrically actuatable vacuum switching valves disposed between said vacuum actuators and a vacuum source for controlling the introduction and blocking of vacuum to and from said actuator;

actuation means for electrically actuating said vacuum switching valves;

a transistor circuit for controlling energization and deenergization of said actuation means;

a logical operation circuit for providing a control signal to said transistor circuit, said logical operation circuit decoding a received binary coded signal to control said transistor circuit;

means for producing binary coded signals each of which is unique to respective one of a plurality of switching modes for said doors and said control elements; and

electrical wires for conducting said binary coded signal produced by said means to said logical operation circuit.

4,320,798

COOLING SYSTEM FOR LIQUID-COOLED INTERNAL COMBUSTION ENGINES

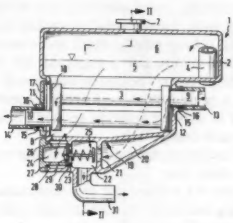
Klaus Obernberger, Odelzhausen, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,952

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916691

Int. Cl.³ G05D *23/00*

U.S. Cl. 165—36 **9 Claims**

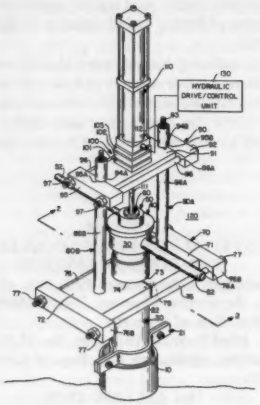


1. A cooling installation for a liquid-cooled internal combustion engine, comprising a housing means, a liquid heat-exchanger means positioned within said housing means for effecting heat exchange between an engine cooling liquid and an external cooling liquid such as fresh water or sea water, means for conveying an external cooling liquid to and from said heat-exchanger means in said housing means, by-pass channel means for the engine cooling liquid in parallel to the heat-exchanger means, said housing means including a mixing chamber means for the cooled and non-cooled portion of the engine cooling liquid, said mixing chamber means being arranged at a distance from the outlet side of the heat-exchanger means and having respective inlet openings leading into the mixing chamber means, one of the inlet openings being operatively connected with the heat-exchanger means and another inlet opening being operatively connected with the by-pass channel means, thermostat means for the temperature-dependent proportional through-flow control of the engine cooling liquid through the heat-exchanger means and the by-pass channel means, said thermostat means being arranged in the mixing chamber means and alternately controlling said respective inlet openings leading into the mixing chamber means, a closure cover means removably secured externally at the housing means being arranged opposite an inlet opening of the mixing chamber means and being operable to close an installation opening for the thermostat means, and wherein the by-pass channel means extends in a shaft-shaped narrow manner essentially over the entire length of the heat-exchanger means.

4,320,799
OIL WELL PUMP DRIVING UNIT

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94566

Filed Sep. 3, 1980, Ser. No. 183,958
Int. Cl.³ F04B *47/04*
U.S. Cl. 166—68.5 **12 Claims**



1. In an oil well pumping apparatus which includes a submerged reciprocating pump mounted in a tubing arrangement communicating with the wellhead, a sucker rod string extending through said tubing arrangement and connected in driving relation with said pump, and a pumping tee and stuffing box arrangement mounted on the casing of the well at the wellhead and including a sealed drive rod arrangement in the stuffing box connected in driving relation to said sucker rod string, a pump driving unit comprising:

an hydraulic cylinder, including a cylinder rod and an in/out hydraulic fluid line;

support means for supporting said hydraulic cylinder over said stuffing box with the axis of said cylinder rod aligned with the axis of said stuffing box;

coupling means for coupling said cylinder rod to said sealed drive rod arrangement; and

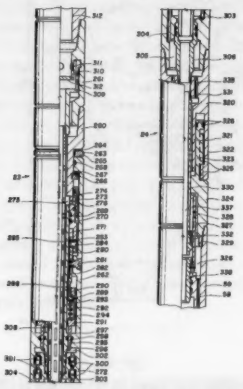
an hydraulic drive/control means coupled to said in/out fluid line for operating said hydraulic cylinder to produce an operating cycle consisting of an hydraulic power upstroke and a gravity power downstroke; said support means including a cylinder support plate, structural means mounting said cylinder support plate above said pumping tee and stuffing box arrangement with the plane of said support plate generally perpendicular to the axis of said stuffing box, and gimbal mounting means positioned on said cylinder support plate for supporting said cylinder in an axially floating manner to adjust automatically the orientation of the axis of said cylinder to bring it into alignment with the axis of said stuffing box when the weight of said sucker rod string is applied to said cylinder rod, thereby to compensate for any small errors in the positioning of said cylinder support plate perpendicular to the axis of said stuffing box.

4,320,800
INFLATABLE PACKER DRILL STEM TESTING SYSTEM

James M. Upchurch, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 14, 1979, Ser. No. 103,660
Int. Cl.³ E21B *43/00, 33/127*
U.S. Cl. 166—106 **20 Claims**

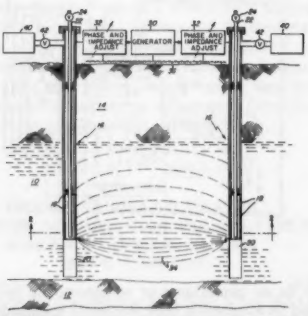
1. In a drill stem testing apparatus having upper and lower inflatable packing elements adapted to be suspended in a well bore on a pipe string, the improvement comprising: first pump means operable in response to rotation of the pipe string for inflating said lower packing element into sealing engagement with the well bore wall to seal off the lower end of a well bore interval; and second pump means operable in response to upward and downward movement of the pipe string for inflating said upper packing element into sealing engagement with the well bore wall to seal off the upper end of said well bore interval.



4,320,801
IN SITU PROCESSING OF ORGANIC ORE BODIES

Howard J. Rowland, Newton, and Joseph T. deBettencourt, West Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 838,264, Sep. 30, 1977, Pat. No. 4,196,329, which is a division of Ser. No. 838,265, Sep. 30, 1977, Pat. No. 4,135,579, and a continuation of Ser. No. 682,698, May 3, 1976, abandoned. This application Nov. 29, 1979, Ser. No. 98,584
Int. Cl.³ E21B *43/24;* H05B *6/62*
U.S. Cl. 166—248 **10 Claims**



1. In combination:

a plurality of electrical members having conductive portions thereof positioned in a subsurface body to be heated;

means for supplying electrical energy to said members having a component which varies at a frequency in the range between 100 kilohertz to 100 megahertz, the length of portions of said members exposed to said body being on the order of a quarter of a wavelength of said frequency;

means for controlling the intensity of the electric field produced in regions of said body to produce a substantial electric field gradient in said body comprising means for

controlling the phase difference of said electrical energy supplied to different members; and

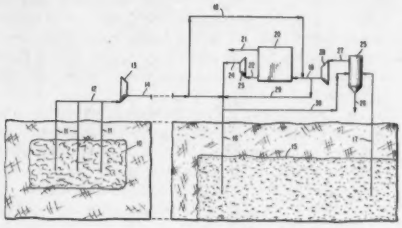
said conductive portions being larger in cross section than support conductors which are connected thereto.

4,320,802

USE OF LAND-FILL GAS TO STIMULATE CRUDE OIL PRODUCTION AND TO RECOVER METHANE-RICH GAS

Paul W. Garbo, 48 Lester Ave., Freeport, N.Y. 11520

Filed Feb. 11, 1980, Ser. No. 120,305
Int. Cl.³ E21B *43/16, 43/40*
U.S. Cl. 166—267 **9 Claims**



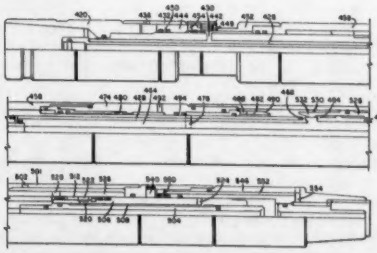
1. The process of utilizing garbage gas to stimulate crude oil production from a partially depleted reservoir and to recover methane-rich gas, which comprises injecting said garbage gas and/or a carbon dioxide-rich fraction thereof into said reservoir to effect pressurization thereof to a carbon dioxide partial pressure of at least about 200 psia, withdrawing the resultant solution of carbon dioxide in crude oil from said reservoir, separating the withdrawn solution into a liquid phase containing crude oil and a gas phase containing methane and carbon dioxide, fractionating said gas phase into methane-rich gas and carbon dioxide-rich recycle gas, and injecting said recycle gas into said reservoir.

4,320,803

VALVE RETRIEVAL MECHANISM FOR AN INFLATABLE PACKER SYSTEM

Phillip H. Manderscheid, Cypress, Tex., assignor to BJ-Hughes Inc., Houston, Tex.

Filed Feb. 26, 1980, Ser. No. 124,664
Int. Cl.³ E21B *41/00*
U.S. Cl. 166—334 **5 Claims**



1. A shifting sleeve retrieving mechanism for use in a valve having a stretched and collapsed configuration, an outer valve member adapted to be fixed against longitudinal movement, an inner valve member adapted to move longitudinally with respect to the outer valve member, a shifting sleeve surrounding a length of the inner valve member and having a spring-biased collet portion with a ramp section, and a body member having at least one indentation therein and adapted to move longitudinally with respect to both outer and inner valve members through an inflate-to-deflate-cycle comprising;

shifting sleeve engaging means forming part of said inner valve member and adapted to move therewith;

said shifting sleeve engaging means adapted to move under the spring-biased collet portion of the shifting sleeve when the shifting sleeve is in the inflate position and the valve is moved to the collapsed configuration, wherein the inner valve member moves longitudinally with respect to the outer valve member and the shifting sleeve;

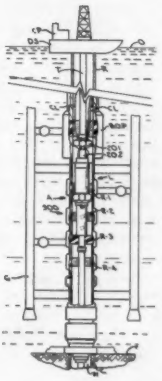
said shifting sleeve engaging means engaging the spring-biased collet portion of the shifting sleeve to return it to a retrieved position when the valve is returned to the elongated configuration by the inner valve member moving longitudinally, with respect to the outer valve member, to its original starting position.

4,320,804

SUBSEA TEST TREE

Robert T. Brooks, Aberdeen, Scotland, assignor to Baker International Corporation, Orange, Calif.

Filed Aug. 6, 1979, Ser. No. 64,332
Int. Cl.³ E21B *33/035, 23/00*
U.S. Cl. 166—339 **26 Claims**



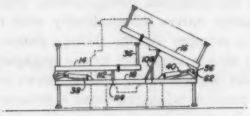
1. In a test assembly securable within a blowout preventer stack above a subterranean well and carriable between upper and lower portions of a tubular conduit extendible to at least one production zone within said well, said test assembly having valve means therein communicable with said upper and lower conduit portions and manipulatable between open and closed positions to control flow of fluid within said conduit, the improvement comprising: latching means for selective disengagement of said upper conduit portion from said lower conduit portion, said latching means comprising: a first rocker section carriable with said upper conduit portion; a second rocker section carriable with said lower conduit portion; lock means having a recess contoured for securement over said rocker sections, said lock means being manipulatable over said first and second rocker sections to locked and unlocked positions; and means shiftable across said lock means to a first position whereby said lock means are engaged over said first and second rocker sections and said conduit portions are communicably secured together, and shiftable to a second position whereby said lock means are disengaged from said second rocker section and said conduit portions are manipulatable to disengaged position, said means shiftable across said lock means comprising a collet assembly operably communicable to piston means and driven to said first position by compressible spring means urged in expanding direction.

4,320,805

WING FOLD IMPLEMENT AND FOLDING SEQUENCE CONTROL THEREFOR

David C. Winter, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 23, 1980, Ser. No. 171,591
Int. Cl.[3] A01B 73/00
U.S. Cl. 172—776 40 Claims



1. In a foldable agricultural implement including a transversely extending main frame and first and second outriggers hingedly connected to the respective outer ends of the main frame, a hydraulic folding system comprising:

first and second hydraulic motor means operably connected to the first and second outriggers respectively for rocking the outrigger frames between a generally horizontally and outwardly extending field-working position and a folded transport position wherein the outriggers are supported above the main frame;

supply means for supplying hydraulic fluid to and operating the first and second motor means;

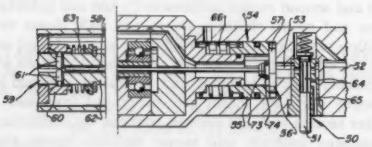
variable rate means operably associated with the supply means for permitting the hydraulic motor means to rock the first outrigger at a faster rate than the second outrigger as the outriggers are rocked from the field-working position to the transport position so that first outrigger reaches its transport position before the second outrigger reaches its transport position, said variable rate means comprising a valve assembly connected between the supply means and one of the motor means, said valve assembly having at least a first operative condition restricting fluid flow to the second motor means relative to the first as the outriggers are rocked toward the transport position and a second operative condition permitting significantly greater fluid flow than in said first operative condition between the second motor means the supply means relative to the fluid flow between the first motor means and the supply means as the outriggers are rocked toward the field-working position.

4,320,806

POWER TOOL, IN PARTICULAR A HAND-HELD COMPRESSED AIR SCREW DRIVER

Jurgen K. D. Koltermann, Aalen; Dieter W. Stein, Oberkochen; Eugen Mattheiss, Lauchheim, and Bernhard J. Polzer, Riesburg, all of Fed. Rep. of Germany, assignors to Deutsche Gardner-Denver G.m.b.H., Westhausen, Fed. Rep. of Germany

Filed Apr. 20, 1979, Ser. No. 31,730
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828379
Int. Cl.[3] B23Q 5/06; B25B 23/145
U.S. Cl. 173—12 10 Claims



1. In a power tool:

a housing;

a compressed air motor disposed in said housing;

passage means in said housing for conducting compressed air to said motor:

a supply valve for controlling the compressed air supply to said motor, and for venting a portion of said passage means in a closed position of said supply valve;

a shutoff valve disposed in said passage means ahead of a compressed air inlet to said motor, said shutoff valve comprising at least two elements which are arranged coaxially with respect to each other and are movable axially independent of each other; one of said elements comprising a reset element and another of said elements comprising a shutoff element, and a valve seat disposed coaxially with respect to said elements in a fixed position in said housing and engageable by said shutoff element in response to movement of said shutoff element in the direction of compressed air flow in said passage means;

biasing means for holding said elements in a starting position while the compressed air supply is shut off by said supply valve; and,

means for holding said shutoff element in a valve open position associated with the starting position and for releasing said shutoff element at a predetermined torque applied to said holding means whereby said shutoff element is operable to move in the direction of compressed air flow in said passage means to engage said seat to shut off compressed air flow to said motor;

said reset element comprising piston means operable upon introduction of compressed air to said passage means due to actuation of said supply valve to move away from said shutoff element to a position to permit movement of said shutoff element to engage said valve seat; and,

said reset element is operable upon movement of said supply valve to cutoff said compressed air supply to said passage means and vent said portion of said passage means between said supply valve and said rest element to engage said shutoff element to reset said shutoff element to said starting position.

10. In a power tool:

a housing;

a compressed air motor disposed in said housing;

passage means in said housing for conducting compressed air to said motor;

a switch for controlling the compressed air supply to said motor;

a shutoff valve disposed in said passage means ahead of a compressed air inlet to said motor, said shutoff valve comprising at least two elements which are arranged coaxially with respect to each other and are movable axially independent of each other; one of said elements comprising a reset element and another of said elements comprising a shutoff element, and a valve seat disposed in a fixed position in said housing and engageable with said shutoff element in response to movement of said shutoff element in the direction of compressed air flow in said passage means;

biasing means for holding said elements in a starting position while the compressed air supply is shut off by said switch; and,

means for holding said shutoff element in a valve open position associated with the starting position and for releasing said shutoff element at a pedetermined torque applied to said holding means whereby said shutoff element is operable to move in the direction of compressed air flow in said passage means to shut off compressed air flow to said motor;

said reset element comprising piston means operable upon introduction of compressed air to said passage means due to actuation of said switch to move away from said shutoff element to a position to permit movement of said shutoff element to engage said valve seat;

said reset element being operable upon cutoff of said compressed air supply to said passage means to engage said

shutoff element to reset said shutoff element to said starting position; and

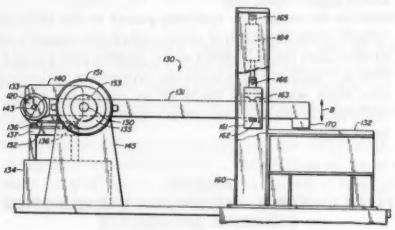
said shutoff element comprises a valve disk having a ring seal disposed thereon, said shutoff element being connected to an actuating rod mounted in said housing and engaged with said holding means.

4,320,807

RESONANT SYSTEM SUPPORT

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Filed Mar. 10, 1980, Ser. No. 128,608
Int. Cl.[3] B06B *1/16;* F16H *33/20*
U.S. Cl. 173—49 7 Claims



1. Resonant work performing apparatus comprising:

a resonant system that is vibratory in a free ringing resonant mode at a resonant frequency, the resonant system having a vibratory input, a vibratory output responsive to vibrations at the input, and at least one effective node dependent in position upon the effective frequency of such input vibrations;

means for applying vibrations to the input of the resonant system at a given frequency near but different from the free ringing resonant frequency to excite the resonant system to vibration in a near resonant mode; and

a frame attached to the resonant system at the position of the effective node for said given frequency so that the transfer of vibration energy from the resonant system to the frame is minimized.

4,320,808

ROTARY DRILL BIT

Wylie P. Garrett, P.O. Box 1672, Hammond, La. 70404

Filed Jun. 24, 1980, Ser. No. 162,463
Int. Cl.[3] E21B *10/16, 10/52*
U.S. Cl. 175—340 17 Claims

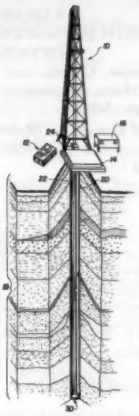
15. A rotary bit cone operable to be mounted upon a rotary drill bit for drilling bore holes through earth formations, said rotary cone comprising:

a generally hollow cone body having,

an interior configuration operable to be rotatably mounted upon a spindle of a rotary drill bit, and

a generally conical shaped exterior configuration;

a plurality of elevated land areas each of which originates from a position adjacent the apex of the cone and extends in a spiral pattern to the base of the cone; and



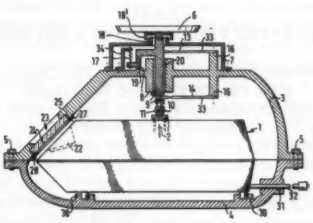
partial disc shaped cutting teeth mounted upon each of said spiral land areas for digging into earth formations as the cone rotates during a drilling operation.

4,320,809

WEIGHING MACHINE WITH EXPLOSION PROOF CASE

Erich Knothe, Bovenden, and Dieter Blawert, Göttingen, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,185
Claims priority, application Fed. Rep. of Germany, May 8, 1979, 7913203[U]
Int. Cl.[3] G01G *21/28*
U.S. Cl. 177—243 14 Claims



1. A weighing machine with a case enclosing the weighing system, provided with an electric or electronic indicator and a weighing scale for holding the material to be weighed, said scale being movable a limited distance in vertical direction and supported by the weighing system, characterized in that, the case enclosing the weighing machine is pressure-proof and offers a specific resistance to a specific explosion pressure issuing from the interior of the case;

the weighing scale is provided outside the pressure-proof case and is supported on a rod system, which penetrates the pressure-proof case in a tightly enclosing and relatively long perforation without contact;

the rod system extending parallel in vertical direction and being supported on the weighing system;

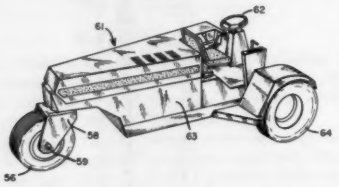
that in the area of the indicator of the pressure-proof case, a pressure-proof inspection glass of transparent material is provided;

and that electric supply and data lines are installed in the pressure-proof case in an explosion-proof manner.

4,320,810
VEHICLE WITH IMPROVED STEERING SYSTEM DEVICE

Kermit C. Hillmann, Cokato, and Tom H. Holsapple, Silver Lake, both of Minn., assignors to Chromalloy American Corporation, Cokato, Minn.

Filed Dec. 17, 1979, Ser. No. 104,046
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.3 **20 Claims**



1. In a vehicle of the type having a pair of drive wheels in which steering is accomplished by applying differential hydraulic flow to the respective drive wheels and a non-driven castor wheel means, the improvement relating to a steering assist device and comprising:

power means for selectively rotating the non-driven castor wheel means about a vertical axis in one of two rotatable directions;

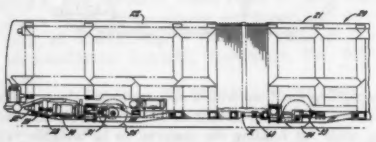
access means for providing access to the hydraulic pressure driving each of said drive wheels;

control means connected with said access means and including means for controlling the actuation of said power means in response to the hydraulic pressure driving said drive wheels and means for causing said means to rotate said non-driven castor wheel means in a direction to assist the drive wheel being driven by the greater hydraulic pressure.

4,320,811
ARTICULATED VEHICLE DRIVE AND CONTROL SYSTEM

Gerard Queveau, Amik Farm, 79140 Le Pin, Cerizay, France

Filed Feb. 19, 1980, Ser. No. 122,466
Claims priority, application France, Feb. 21, 1979, 79 04363
Int. Cl.³ B62D *47/02*
U.S. Cl. 180—14 A **11 Claims**



1. A method of propelling an articulated vehicle having a forward and rear section connected at an articulation connection, the vehicle having a source of driving power, the rear section having a first set of wheels driven by the source of driving power, the forward section having a second set of wheels for steering the vehicle, a third set of wheels and means for selectively applying driving power to the third set of wheels, said means being selectively actuated by a control means, the source of driving power generating a total propulsion force to be divided among and applied at the road surface by any driven wheels of the vehicle, the total propulsion force being applied to the road surface solely by the first set of wheels at times when the third set of wheels is not driven and applied in part by the first set of wheels and in part by the third set of wheels when both of said sets are simultaneously driven, the articulation connection transmitting a connection force between the forward and rear sections, the method comprising:

monitoring parameters with at least one transducer having an output from which values for the instantaneous angle of articulation between the sections and the magnitude of the connection force may be derived;

monitoring further parameters with at least one additional transducer having an output from which a value for the instantaneous magnitude of the total propulsion force generated by the source of driving power may be derived;

determining the actual ratio of the value for the derived connection force to the value for the derived propulsion force;

comparing the actual ratio to a ratio calculated from a predetermined drive system rule, the ratio calculated from the rule being a function of the instantaneous articulation angle;

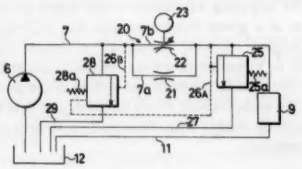
driving only the first set of wheels when the actual ratio is less than the calculated ratio for the instantaneous articulation angle value; and

actuating the means for applying power to the third set of wheels with the control means when the actual ratio is greater than the calculated ratio, thereby driving both the first and third sets of wheels, the proportion of the propulsive force applied by the third set of wheels being that sufficient to maintain the actual ratio less than the calculated ratio.

4,320,812
FLOW CONTROL SYSTEM FOR USE IN POWER STEERING APPARATUS

Shuji Takaoka, Osaka, and Shoji Fujimoto, Kagawa, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Filed Dec. 3, 1979, Ser. No. 100,249
Claims priority, application Japan, Dec. 5, 1978, 53-167828[U]
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—143 **5 Claims**



1. A flow control system for use in a power steering apparatus including a fluid cylinder for amplifying the manual steering torque and a control valve associated therewith, a hydraulic pump for feeding pressure fluid to said fluid cylinder via said control valve, a pressure fluid feed line extending from said hydraulic pump to said control valve, a fixed restrictor for fixing a flow rate installed in said pressure fluid feed line, a variable restrictor for providing a variable flow rate installed in said pressure fluid feed line in parallel relation to said fixed restrictor, and vehicle speed-responsive control means for controlling the amount of restriction of said variable restrictor in response to the increase and decrease of the vehicle speed, said vehicle speed-responsive control means comprising:

a stepping motor for changing the amount of restriction of said variable restrictor by rotating said restrictor by a specific angle,

a vehicle speed sensor which produces electric signals corresponding to the vehicle speed, and

a stepping motor control device for controlling the angle of rotation of said stepping motor by actuation of exciting

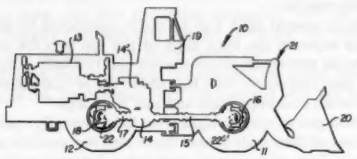
coils thereof by means of the electric signals from said sensor.

4,320,813

DIFFERENTIAL LOCK CONTROL

Albert Manna, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/01090, § 371 Date Dec. 10, 1979, § 102(e) Date Dec. 10, 1979
PCT Filed Dec. 10, 1979, Ser. No. 140,384
Int. Cl.³ B60K *17/34*
U.S. Cl. 180—249 21 Claims



1. In a vehicle (10) having a frame (27,30;127,130), an engine (13) carried by the frame, a first wheeled axle (22), a second wheeled axle (22'), and means including a differential (14) for differentially driving said axles from said engine, the improvement comprising

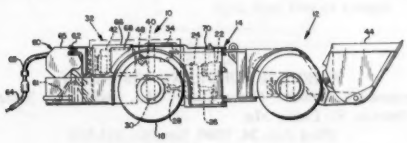
control means (51,151) connected to said differential and comprising means responsive to a deflection of one of said axles for locking said differential as a result of said deflection becoming a preselected deflection.

4,320,814

ELECTRIC-HYDROSTATIC DRIVE MODULES FOR VEHICLES

Paul J. Middelhoven, Portland, Oreg., assignor to Paccar Inc., Bellevue, Wash.

Filed Jul. 31, 1979, Ser. No. 62,365
Int. Cl.³ B60K *17/10*
U.S. Cl. 180—294 14 Claims



1. An electric-hydraulically powered vehicle comprising:

a chassis having a main frame portion and an upwardly removable subframe portion;

resilient mounting means for resiliently mounting the subframe portion on the main frame portion;

an electric motor and a drive train component independently secured to the subframe portion;

connecting means for drivingly connected an output shaft of the motor to an input shaft of the drive train component; and

drive means drivably connected to and supported by the drive train component for powering said vehicle;

such that the subframe portion, motor and drive train component define a power unit which is upwardly removable as a unit from the main frame portion;

the subframe portion including adjustable mounting means for positioning the motor and drive train component on the subframe portion to axially align their shafts for connecting while the unit is removed from the main frame portion, and for rigidly securing said motor and drive train component to the surframe portion prior to installation of the unit in the vehicle;

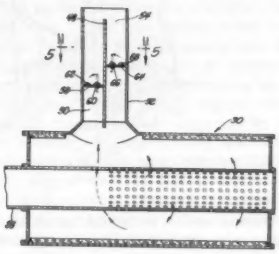
the adjustable mounting means including means for titling the drive train component relative to the motor to angularly align said shafts before securing to the subframe portion.

4,320,815

NOISE REDUCTION IN ENGINE EXHAUST

Thomas R. Norris, Orinda, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 159,730
Int. Cl.³ F01N *1/08, 1/16*
U.S. Cl. 181—226 2 Claims

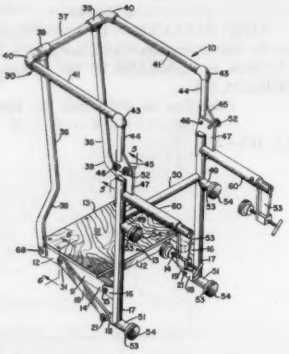


1. In a vehicle having an engine, and an exhaust system for the combustion by products produced by said engine: the improvement comprising an exhaust noise reduction mechanism; said noise reduction mechanism including a circular pipe arranged to discharge said combustion by products into the ambient atmosphere; a means for partitioning the pipe into three separate passages, including a first partition spanning the pipe near its diameter to define a first passage, and a second partition extending normal to the first partition to define second and third passage; the two partitions being oriented so that the first passage has the largest flow area, the second passage has an intermediate flow area, and the third passage has the smallest flow area; a first flow throttling plate swingably mounted in the first passage for rotation around an axis transverse to the first passage axis whereby said plate is movable between a zero flow position extending transverse to the first passage axis and a maximum flow condition extending parallel to the first passage axis; means biasing the first flow throttling plate toward its zero flow position in opposition to the force of the exhaust gases flowing from the engine through the first passage; second flow throttling plate swingably mounted in the second passage for rotation around an axis transverse to the second passage axis whereby said second plate is movable between a zero flow position extending transverse to the second passage axis and a maximum flow condition extending parallel to the second passage axis; second means biasing the second flow throttling plate toward its zero flow position in opposition to the force of the exhaust gases flowing from the engine through the second passage; said third passage being devoid of flow throttling mechanisms whereby said third passage is in a continuously open condition; the biasing means for the second flow throttling plate being effectively weaker than the biasing means for the first flow throttling plate whereby the second throttling plate has movement in the intermediate range of engine speed and the first throttling plate has movement in a higher range of engine speeds, the first and second biasing means and flow throttling plates being sized so that the average static pressure in the exhaust system does not exceed the particular engines back pressure limit throughout the speed range of the engine, from idle up to maximum speed.

4,320,816
WINDOW PERCH

Phyllis M. Callahan; Emmanuel K. Christian, and Josiah W. Christian, all of 1510 Columbia Rd., Washington, D.C. 20009

Filed Oct. 21, 1980, Ser. No. 199,194
Int. Cl.[3] A47L 3/02
U.S. Cl. 182—55 6 Claims



1. A workman support collapsible perch for attachment to a sash window whereby the workman is supported externally of said window comprising a double parallel attached together C-clamp means, a first leg of each of said C-clamp means adapted and constructed when used to be in abutting arrangement against the inside of the portion of the wall under the window, a second leg of each of said C-clamp means adapted and constructed when used to be in abutting arrangement against the outside of the portion of the wall under the window, the bridging portions between said first leg of each C-clamp means and said second leg of each C-clamp means when used adapted and constructed to be in confrontation with a windowsill, workman support platform means pivotably mounted normal when used to a terminal end portion of each of said second leg, U-shaped hand rail means when used extending horizontally from means at substantially a mating portion between each of the second legs and the said bridging portions, said rail means adapted and constructed to be demountable from said mating portions, pivotable upright means connecting the workman support platform and the rail means.

4,320,817
COMBINED CHAIR AND STOOL APPARATUS

Silas J. Knoke, Seymour, and James F. Stamper, Nashville, both of Ind., assignors to Lear Siegler, Inc., Seymour, Ind.

Filed Sep. 7, 1979, Ser. No. 73,151
Int. Cl.[3] A47C 4/00, 3/18, 9/00
U.S. Cl. 182—126 6 Claims

1. A combination chair and stool apparatus having a folded position and a supporting position, said apparatus comprising:

a pair of front legs;

upper and lower support members extending between the front legs and secured thereto;

a pair of planar steps comprising upper and lower steps, each of said steps having an upper support surface extending in a substantially horizontal direction in the supporting position and extending in an approximately vertical direction in the folded position;

a pair of spaced, rigid pivot links pivotally connected at their opposite ends to said upper support member and to the back portion of said upper step, the pivot links extending rearwardly from said upper support member, the upper support member supporting said upper step at its front portion in said supporting position, the lower step being pivotally attached at its front portion to said lower support member;

a pair of spaced back legs pivotally connected to said top step adjacent the back edge of the top step for relative pivotal movement therebetween and pivotally connected to their respective front legs above the pivotal connection between said upper step and said back legs;

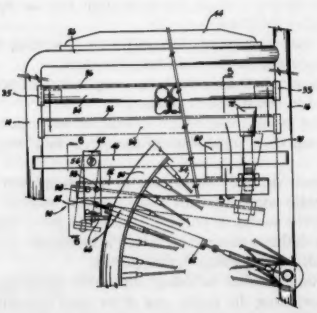
a second pair of spaced, rigid pivot links pivotally connected at one of their ends to said upper step at a position spaced away from said pivotal connection between said upper step and said first pair of pivot links toward the front portion of said upper step and pivotally connected at their opposite ends to the back portion of said lower step, wherein said second pair of links holds the step of the apparatus in the supporting position thereof, wherein said second pair of pivot links engage said upper support member in the folded position, and wherein the pivotal connection of the second pair of links to the lower step moves forward of a line between the pivotal connection of the lower step to the front legs and the pivotal connection of the second pair of links to the upper step upon movement of the apparatus to the folded position to thereby provide overcenter locking thereof with the second pair of links engaging the upper support member between the front legs; and

a locking means including a locking member having a locking position where the locking member extends between said upper step and said upper support member to provide locking of said apparatus in said supporting position to prevent said pivotal movement of said front legs with respect to said back legs.

4,320,818
WHEELCHAIR BRAKE ASSEMBLY

Raymond E. Knoche, Creve Coeur, Mo., assignor to Bohn & Dawson, St. Louis, Mo.

Filed Jan. 24, 1980, Ser. No. 114,846
Int. Cl.[3] B60T 1/04
U.S. Cl. 188—2 F 11 Claims



1. A brake assembly for a folding wheelchair having opposed side frames connected by a collapsible cross frame, each

side frame carrying a drive wheel and having a seat portion extending between the side frames and movable downwardly under the weight of a user, the brake assembly comprising:

(a) at least one brake arm, extending in a fore and aft direction relative to the wheelchair, and having forward and rearward portions, said arm being pivotally mounted at the forward portion to an adjacent side frame, the brake arm including:

1. brake means spaced from the pivot axis and carried by the forward portion for engagement with the wheel carried by said adjacent frame, and

2. engagement means carried by the rearward portion and having a free end spaced from the seat portion until the seat portion is moved downwardly under the weight of a user, said free end being engagable with the downwardly movable seat portion to rotate the brake arm and disengage the brake means, and

(b) biasing means between the arm and the frame tending to urge the brake means into engagement with the wheel.

4,320,819

SEAT-OPERATED BRAKE ASSEMBLY WITH BRAKE PROTECTION MEANS

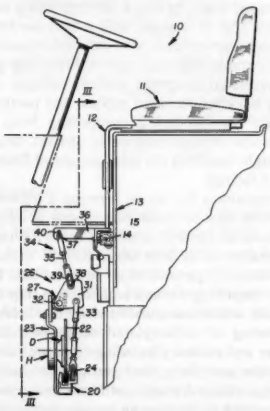
James W. Erker, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00243, § 371 Date Mar. 6, 1980, § 102(e) Date Mar. 6, 1980, PCT Pub. No. WO81/02551, PCT Pub. Date Sep. 17, 1981.

PCT Filed Mar. 6, 1980, Ser. No. 189,959

Int. Cl.³ B60T *7/12*; F16D *65/30*

U.S. Cl. 188—109 **11 Claims**



1. In a seat-operated brake assembly **(10)** having a seat **(11)** movable between first and second positions, a brake assembly **(20)**, an actuating means **(26)** for disengaging said brake assembly **(20)** when said seat **(11)** is at its first position and for engaging said brake assembly **(20)** in response to said seat **(11)** being at its second position the improvement comprising

means **(34** or **34')** for maintaining said brake assembly **(20)** in its disengaged condition through a solid linkage connection when said seat **(11)** is at its first position and for isolating movement of said seat **(11)** from said brake assembly by breaking said solid linkage connection **(20)** after engagement of said brake assembly **(20)**.

4,320,820

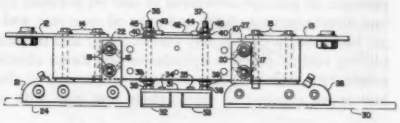
SECTION INSULATOR WITH IMPROVED ARC CONTROL

Charles F. Elbert, Mansfield, Ohio, assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 28, 1980, Ser. No. 172,689

Int. Cl.³ B60M *1/18*

U.S. Cl. 191—39 **3 Claims**



1. An improved section insulator for a trolley system, the section insulator being of the type having a first elongated support member of insulating material, second and third support members fixedly attached below and at opposite ends of said first support member for retaining the ends of electrically conductive trolley wires in substantially aligned relationship and an intermediate runner member supported by said first support member between and longitudinally spaced from said second and third members, said runner member having a surface substantially aligned with the trolley wires retained by said second and third members such that a current collector can longitudinally pass respectively along the aligned wires and surface, the improvement comprising:

first and second electrically conductive bodies forming said intermediate runner member;

first and second elongated electrically conductive shafts attached to said first and second bodies and extending upwardly through said first support member for holding said first and second bodies in longitudinally spaced aligned relationship with each other and with said trolley wire;

an electrical conductor extending between and interconnecting points near the upper ends of said shafts to form with said first and said second electrically conductive bodies and said shafts a current conductive path which abruptly diverges from and returns to the path along which the trolley wires are aligned for producing magnetic fields tending to blow down arcs forming between the ends of said runner member and said trolley wires.

4,320,821

CONTROL DEVICE FOR A TORQUE CONVERTER IN AN AUTOMATIC SPEED CHANGE GEAR FOR VEHICLES

Sadanori Nishimura, 299-10, Tsuchiya, Ohmiya-shi, Saitama-ken, Japan

PCT No. PCT/JP78/00023, § 371 Date Jul. 18, 1979, § 102(e) Date Jul. 18, 1979, PCT Pub. No. WO79/00410, PCT Pub. Date Jul. 12, 1979.

PCT Filed Nov. 10, 1978, Ser. No. 58,676

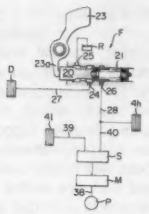
Claims priority, application Japan, Dec. 20, 1977, 52-153873

Int. Cl.³ F16D *25/10*; F16H *41/18*

U.S. Cl. 192—3.31 **2 Claims**

1. A control device for a torque converter in an automatic speed change gear for a vehicle, said automatic speed change gear having an input shaft connected to a driving shaft of an engine of the vehicle through a torque converter, said torque converter having a pump disc associated with said driving shaft and a turbine disc associated with said input shaft, said input shaft being connected to an output shaft through at least a two-stage gearing including a low speed geared device and high speed geared device, said low speed and high speed geared devices having respective hydraulically operated means including oil pressure cylinders, and an oil pressure source, said control device comprising a shift valve disposed between the oil pressure cylinders of said hydraulically oper-

ated means and said oil pressure source for selectively connecting the oil pressure source with one of said oil pressure cylinders, a hydraulically operated direct coupling clutch disposed between said pump disc and said turbine disc for directly coupling said pump disc and turbine disc, said direct coupling clutch including an oil pressure cylinder, a high pressure oil passage connected to said oil pressure cylinder of said direct coupling clutch and to the oil pressure cylinder of said hydraulically operated means of said high speed geared device, a low pressure oil passage connected to said oil pressure cylinder of said direct coupling clutch and to an oil reservoir, and centrifugal valve means operatively connected to said turbine disc for placing said oil pressure cylinder of said direct clutch in communication with said low pressure oil passage at the time of low speed rotation of said turbine disc and with said high



pressure oil passage at the time of high speed rotation of said turbine disc, said oil pressure cylinder of said direct coupling clutch being formed in one of two opposed annular inner peripheral walls of said pump disc and said turbine disc, said walls defining therebetween a transmission oil passage, said direct coupling clutch further comprising a clutch-operating pressure piston in said oil pressure cylinder so that oil pressure in said transmission oil passage acts on one surface of said pressure piston to bias said piston and avoid the use of a biasing spring, said oil pressure operated means of said high speed geared device comprising a hydraulically operated clutch mounted on said input shaft, said centrifugal valve means comprising an annular valve body fitted between said turbine disc and said input shaft, and an oil passage in said input shaft connecting said centrifugal valve means and said hydraulically operated clutch.

4,320,822

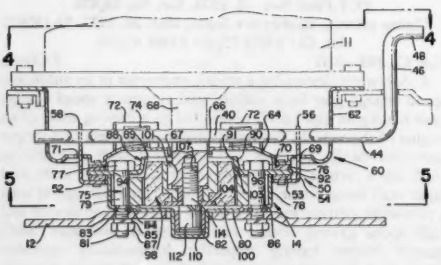
CLUTCH-BRAKE SYSTEM FOR ROTARY MOWER

Robert D. Meldahl, Granville, and Robert J. Borel, Columbus, both of Ohio, assignors to J. A. Masterson & Company, Columbus, Ohio

Continuation-in-part of Ser. No. 808,336, Jun. 20, 1977, Pat. No. 4,226,313. This application May 2, 1980, Ser. No. 146,101

Int. Cl.³ F16D *67/02*

U.S. Cl. 192—18 R **14 Claims**



1. A brake clutch mechanism for a rotary power mower having a cutting blade member comprising:

a clutch assembly including a brake disc;

a pivotal control lever for operating such clutch assembly and brake disc;

said clutch assembly having a cylindrical drum and tapered cone of frictional material forming a cone clutch and operating in association with a mating tapered metal clutch cone cup fixed to said brake disc;

said brake disc including means which simultaneously transfer power from the clutch assembly to the cutting blade member.

wherein actuation of the pivotable control lever causes the clutch assembly and brake disc to gradually engage, and further wherein the tapered cone produces a gradual acceleration in the cutting blade member;

a plurality of flyweight pivotally mounted on said brake disc outwardly of said clutch drum which are pivotally connected to clutch shoes permitting the contact forces between the clutch shoes and drum to be distributed uniformly, thereby transmitting power to the cutting blade member.

4,320,823

FRICTION MEMBERS FORMED FROM COMPOSITIONS CONTAINING ARAMID FIBERS AND AN AQUEOUS HEAT-HARDENABLE CEMENT COMPRISING A WATER SOLUBLE PHENOLIC RESIN AND A HEAT-CURABLE ELASTOMER

Stanley F. Covaleski, Milford, Conn., assignor to Raybestos-Manhattan, Inc., Stratford, Conn.

Filed Jun. 21, 1979, Ser. No. 50,598

Int. Cl.³ B32B *25/02, 27/04, 27/34, 27/42;* **F16D** *69/02*

U.S. Cl. 192—107 M **34 Claims**

1. A disc-shaped clutch facing having an inner diameter and an outer diameter, said facing comprising a tape impregnated with an aqueous base heat-hardenable cement and disposed in spiral or undulating fashion and having been subjected to heat and pressure to compress said tape to form a disc-shaped facing and to cure said cement, said tape comprising a plurality of strands of aramid fibers having a decomposition temperature of at least about 850° F. coated with a heat-hardenable cement comprising a water-soluble, one-step thermosetting phenolic resin, a heat-curable elastomer selected from the group consisting of carboxylated neoprene rubber, carboxy nitrile rubber and carboxy butadiene styrene rubber, and particulate friction modifier, said friction facing comprising from about 40 to about 95 percent of heat-hardenable cement, said percentages being by weight based on the total weight of fibers and cement solids in said facings.

18. A composition for use in forming a friction member of improved resistance to wear comprising a mixture of from about 5 to about 60 percent of aramid fibers having a decomposition temperature of at least about 850° F. coated with from about 40 to about 95 percent of an aqueous base heat-hardenable cement comprising a water soluble, one-step thermosetting phenolic resin, and a heat-curable elastomer selected from the group consisting of carboxylated neoprene rubber, carboxy nitrile rubber and carboxy butadiene styrene rubber, and particulate friction modifiers, said percentages being by weight based on the combined weight of fibers and cement solids.

25. The method of forming an annular facing for a clutch or the like comprising the steps of:

(A) impregnating a plurality of yarns comprising aramid filaments having a decomposition temperature above about 850° F. with a heat-curable system comprising from about 5 to about 40 percent of a vulcanizable rubber selected from the group consisting of carboxylated neoprene rubber, carboxy nitrile rubber and carboxy butadiene styrene rubber, from about 5 to about 40 percent of a water-soluble, low molecular weight one-step, thermosetting phenolic resin, and from about 20 to about 80 percent of particulate friction modifier, said percentages being by weight, based on the combined weight of said components of said cement system, by passing said yarns through a

high solids aqueous dispersion of said cement system containing from about 0.01 to about 5 percent, based on weight of cement system solids, of a surfactant or dispersant,

(B) drying said yarns impregnated with said heat-curable cement system,

(C) winding said yarns in spiral or undulating fashion to form a disc-shaped clutch facing preform, and

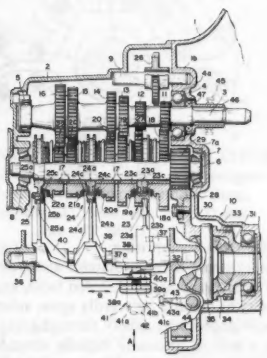
(D) subjecting said preform to heat and pressure to densify said preform and cure said cement.

4,320,824

CLUTCH HOUSING FOR A TRANSMISSION

Kotei Takahashi, Tokyo; Teruo Endo, Fujisawa, and Masayuki Kawaguchi, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 4, 1980, Ser. No. 109,641
Int. Cl.[3] F16D *13/68*
U.S. Cl. 192—115 6 Claims



1. In combination:

a clutch housing for the transmission of an automotive vehicle, said housing having an integral front cover with a stepped hole extending therethrough, said hole having a first minimum diameter portion, an intermediate second portion with a diameter larger than that of said first portion, and a third portion having a diameter larger than that of said second portion;

an input shaft extending through said hole;

a bearing for rotatably supporting said input shaft, said bearing having an outer race seated within said third hole portion and fixed relative to said front cover, and an inner race surrounding and fixed relative to said input shaft;

a release bearing sleeve surrounding said input shaft, said bearing sleeve being detachably secured to said front cover and having an enlarged diameter base portion received in the first minimum diameter portion of said hole, said base portion being spaced from said bearing by the axial length of the intermediate second portion of said hole; and,

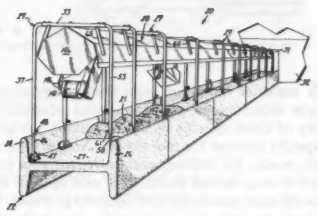
an oil seal surrounding and in sealing contact with said input shaft, said oil seal being surrounded by and fixed relative to the enlarged diameter base portion of said release bearing sleeve.

4,320,825

MATERIAL CONVEYING APPARATUS

Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 28, 1980, Ser. No. 115,608
Int. Cl.[3] B65G *47/46*
U.S. Cl. 198—360 33 Claims



1. An apparatus for dispensing material through an elongated location comprising:

first means for moving the material along a generally linear path above the elongated location,

said first means including an elongated support having a longitudinal groove therein,

endless belt means associated with said support for moving the material in said generally linear path,

a drive pulley and a driven pulley spaced from said drive pulley,

said belt means extended between and engageable with said pulleys,

drive means for rotating said drive pulley to cause said belt means to move along said support,

belt tensioning means cooperatively associated with said belt means to maintain tension thereon as said belt means moves along said support,

sweep means movable relative to the support and belt means operable to move material from said belt means toward the location,

said sweep means including base means slidably supported on said support for movement therealong in said linear path,

a cylindrical roller disposed in driving engagement with the top side of an upper run of said belt means,

means rotatably mounting said roller on said base means transversely of the direction of movement of said belt means,

drum means extended diagonally across said belt means,

means rotatably mounting said drum means on said base means,

drive means drivably connecting said roller and said drum means whereby the drum means is driven by the roller which is rotated in response to said belt means,

powered means positioned in said groove and connected to said base means operable to move the sweep means along the linear path, and,

movable diverter means mounted on the sweep means and disposed to receive material dislodged from the belt means by the diagonal drum means and to direct material to said elongated location as said sweep means moves along said linear path.

4,320,826

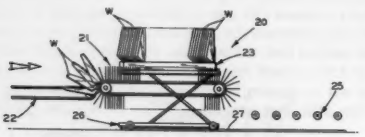
MATERIAL HANDLING METHOD AND APPARATUS

Joseph O. Kramer; Otto V. Young, both of Toledo; Charles E. Banner, and John D. Schuster, both of Sylvania, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Feb. 15, 1980, Ser. No. 121,795

Int. Cl.[3] B65G *47/52*

U.S. Cl. 198—425 26 Claims



5. A material handling apparatus comprising: a frame, a conveyor mounted on said frame and adapted to support a plurality of sheet articles in a substantially upright, longitudinally spaced relation for movement along a generally horizontal path, means for shifting said conveyor to a predetermined position, a rack, means positioning said rack in vertical alignment with said conveyor and including means for precisely orienting said rack relative to said conveyor, means securing said rack in said precisely oriented relationship against horizontal movement, said positioning means including means for moving said rack vertically relative to said conveyor for transferring a plurality of accumulated sheet articles therebetween.

4,320,827

CHAIN CONVEYOR

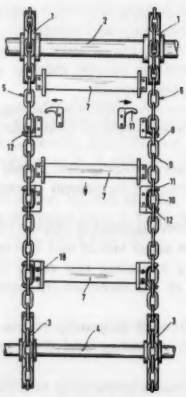
Alfred Puppel, Kaiser-Wilhelm-Allee 10, 5600 Wuppertal-1, and Hans H. Dalferth, Eifelstrasse 21, 7080 Aalen-Wasseralfingen, both of Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,193

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 2925046

Int. Cl.[3] B65G *19/24*

U.S. Cl. 198—731 11 Claims



1. A chain conveyor having at least two chain strands, formed from oval chain links and running over sprockets, and conveyor elements which are connected to the chain strands via pairs of projections which engage in the free inner space of two successive chain links oriented perpendicular to the sprocket axis, the space between said two successive chain links orientated perpendicular to the sprocket axis being occupied by an intermediate chain link (**10**) positioned between the free ends of said projections, the shortest distance a_{min} between the free ends of said projections, which can be mounted without releasing the tension of the chain strands, of each pair of projections in the operating position being smaller than the length L of the intermediate chain link gripped by the projections, one of the projections having an arcuate outline on the side facing one arcuate end of the intermediate chain link, the projections (**11,12;25,26;31,32,36,37**) gripping said intermediate chain link in each case being formed by parts which can move relative to one another during assembly but are locked when in the operating position, and the other of the projections (**12;26;32;37**) having an arcuate outline on its side facing the other arcuate end of the intermediate chain link.

4,320,828

ARM-TYPE FEEDER WHEEL FOR UNLOADING SOLIDS FROM A BIN

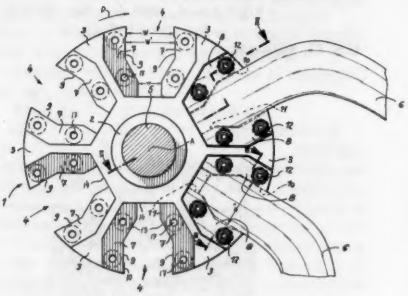
Lothar Teske, Hegelstr. 15, 5000 Cologne 90, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,609

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938165

Int. Cl.[3] B65G *29/00*

U.S. Cl. 198—803 10 Claims



1. A feeder wheel comprising:

a hub disk centered on and rotatable about an axis, having a pair of axially oppositely directed faces, and formed with a plurality of radially outwardly open, substantially angularly equispaced, and axially throughgoing notches each having a pair of generally radially extending and angularly spaced edges each stepped at a shoulder;

respective feeder arms each having an outer end projecting radially from said disk at the respective notch and an inner end received in the respective notch and each formed with a pair of angularly oppositely projecting flanges engaging axially the respective shoulders; and

fasteners extending through said disk and arms at said flanges and shoulders for securing said arms on said disk.

4,320,829

MERCHANDISE DISPLAY CONTAINER

Lawrence P. DiMarzio, and Daniel Altilio, both of New York, N.Y., assignors to DiMarzio Musical Instrument Pickups, Inc., Staten Island, N.Y.

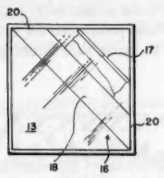
Filed Jan. 15, 1980, Ser. No. 112,300

Int. Cl.[3] B65D *5/50, 1/34*

U.S. Cl. 206—45.15 7 Claims

1. A merchandise display container comprising a parallelipiped transparent plastic box, a first end of said box being open to provide an opening into an interior of said box which is defined by first, second, third and fourth sides and a second closed end, removable cover means for covering said opening, a trapezohedral display insert for said box, said insert including a display surface adapted for mounting said merchandise thereon, a first slanted wall having a first edge joined along a

first edge of said display surface, said first slanted wall having a second edge remote from said first edge, a second slanted wall having a third edge joined along a second edge of said display surface opposed to said first edge, said second slanted wall having a fourth edge remote from said second edge, said first and second slanted walls being disposed at substantially right angles to each other, said insert being slidable through said opening with said first and second slanted walls abutting



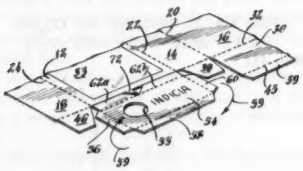
inside surfaces of said first and second adjacent sides, said second and fourth edges of said first and second slanted walls abutting said third and fourth sides respectively of said box adjacent their respective junctions with said first and second sides, and said surface being supported diagonally to said box by said first and second slanted walls whereby said merchandise is supported by said display insert in a position where it is displayed through said first and second sides of said box.

4,320,830

CARTON HAVING PIVOTABLE PLATFORM

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 17, 1980, Ser. No. 131,082
Int. Cl.³ B65D *5/50*
U.S. Cl. 206—45.19 **8 Claims**



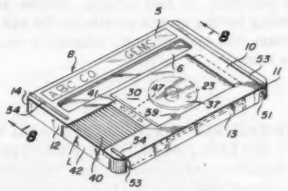
1. A carton comprising:
a plurality of sidewalls joined together along mutual edges thereof to form a tube;
a bottom wall joined along a bottom edge of at least certain of said sidewalls and enclosing one end of said tube;
a platform within said tube and spaced above said bottom wall,
said platform including a flap member hingedly connected thereto and extending downwardly toward said bottom wall,
one face of said flap member being disposed in side-by-side abutting relationship to one of said sidewalls; and
means for interconnecting said flap member with said one sidewall comprising a tab disposed in side-by-side overlapping relationship with the other face of said flap member, said tab having a pair of adjacent edges thereof respectively hingedly connected with a lower edge of said one sidewall and with said flap member.

4,320,831

PLASTIC CONTAINERS FOR SMALL VALUABLE ARTICLES

Bela G. Szabo, 105 Park Rd., Rosslyn Farms, Carnegie, Pa. 15106, and Dean J. Hirschfield, 261 Trotwood Dr., Pittsburgh, Pa. 15241

Filed Jul. 1, 1980, Ser. No. 165,041
Int. Cl.³ B65D *25/54, 81/00*
U.S. Cl. 206—45.34 **20 Claims**



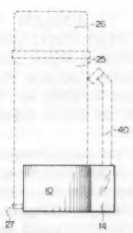
1. A combined storage, shipping and display container of molded plastic material for holding at least one valuable article of small size, comprising
(a) a unitary base formed of a top with a plurality of integrally molded intersecting vertical wall portions,
(b) said top having a depressed storage portion within the confines of said base,
(c) said storage portion having a generally rectangular outline with an elongated slot at one end thereof,
(d) a lowered web at the opposite end of said storage portion in the lowermost plane of said base,
(e) a receptacle for said article in said storage portion,
(f) a detachable rockable cover for said storage portion having a terminal flange engageable within said slot to permit the alternative disposition of said cover in overlying relation to said storage portion or in varying planes at different angles with respect to the latter,
(g) a depressed finger tab on the free end of said cover opposite said terminal flange and overlying the inner end of said lowered web, and
(h) a locking member movable over said web for selective engagement over the top of said finger tab for preventing the rocking movement of said cover.

4,320,832

CLIP FOR HOLDING SAFETY RAZOR

Richard Edstrom, 239 E. 58th St., New York, N.Y. 10022

Filed Aug. 6, 1979, Ser. No. 63,759
Int. Cl.³ B65D *16/00*
U.S. Cl. 206—228 **8 Claims**



1. A clip for holding a razor, which comprises:
a member having an arcuate portion with a sleeve-like portion extending therefrom;
said arcuate portion having an internal diameter that gener-

ally corresponds to the external diameter of an aerosol shaving container;

said arcuate portion being generally resilient to enable it to be snapped onto an aerosol shaving container and retained thereon;

said arcuate portion terminating at a pair of opposed ends which define a space for inserton of an aerosol container, each of said ends carrying means for spacing the aerosol container from the plane on which it rests; and

said sleeve-like portion extending radially outwardly from the periphery of said arcuate portion and defining an opening having an axis parallel to the axis of said arcuate portion, said opening being adapted to receive the handle of a razor.

4,320,833

CARTRIDGE FOR A VIDEO-DISK, AND VIDEO-DISK SUITABLE FOR SUCH A CARTRIDGE

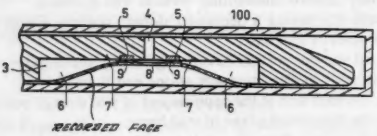
Pierre Antoniotti; Alain Matge, and Philippe Guillon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 14,902, Feb. 23, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,565

Claims priority, application France, Feb. 24, 1978, 78 05338

Int. Cl.³ B65D *85/57*

U.S. Cl. 206—309 **9 Claims**



1. In combination: a flexible video disc having a magnetic means centrally located thereon and a recorded face; and a cartridge for enclosing said flexible video-disc said cartridge comprising:

a sleeve; and

a tray for being placed into said sleeve; said tray having a cavity having a bottom surface for containing said video-disc with its recorded face facing away from said bottom surface, said tray including means for magnetically attracting said centrally located magnetic means to maintain the center of said disk immobile in said cavity, said cavity having a depth which exceeds the thickness of said video disc by such an amount that when said tray is placed into said sleeve, in a position with said bottom surface of said cavity facing downward so that said bottom surface of said cavity is above said disc, said disc forms a bell shape to touch said sleeve only along a circular band delimited by its external perimeter so that said recorded face cannot touch said sleeve.

4,320,834

REEL CONTAINER

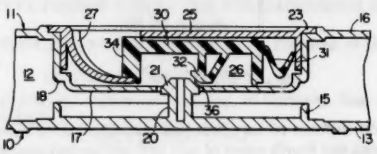
Tohru Tamaki, Sagamihara, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1980, Ser. No. 145,027

Int. Cl.³ B65D *45/00, 85/57*; G11B *23/02*; E05C *1/10*

U.S. Cl. 206—404 **1 Claim**

1. In a reel storage container comprising a body and a cover defining a chamber adapted to receive a reel, said cover having a generally planar top surface, a central recess from said top surface, and walls defining an elongate handle extending across said recess, said handle having said surfaces generally normal to said top surface adapted for manual engagement from the outer surface of said cover, and having a channel along its surface adjacent said body and an opening into said channel adjacent one end; a centrally located latch assembly for releasing coupling the body and cover together, said latch assembly including a central post fixed on said body and projecting into the channel in said handle when said body and cover are assembled which post has a generally mushroom-shaped head at its end, and a latching member mounted on said cover within said channel for movement between latching and release positions having a projection adapted to engage under said mushroom-shaped head when said latching member is in said latching position and the body and cover are assembled, a cam surface on said projection adapted to engage the end surface of said mushroom-shaped head and move said latching member toward its release position when said projection is moved past said mushroom-shaped head as said body and cover are assembled, and a contact surface positioned for manual engagement through said opening to move said latching member to said



release position; and a spring integrally molded with said latch assembly for biasing said latching member toward said engaging position, the improvement wherein:

said latching member is slidably mounted within said channel between said latching and release positions in a position recessed from said top surface;

said spring is formed at the end of said latching member opposite said contact surface and bears against said cover; and

said contact surface positioned for manual engagement through said opening to move said latching member to said release position is disposed generally transverse of the side surfaces of said handle and generally normal to the top surface of said cover.

4,320,835

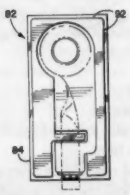
DESK ACCESSORY SYSTEM

Marlan H. Polhemus, 1853 N. Fremont St., Chicago, Ill. 60614, and Lonnie E. Frye, 1312 N. Douglas, Arlington Heights, Ill. 60004

Filed Feb. 22, 1980, Ser. No. 123,680

Int. Cl.³ B65D *85/60*; A45C *11/34*

U.S. Cl. 206—411 **36 Claims**



1. Apparatus for dispensing adhesive tape from an annular roll which has an outside diameter substantially greater than the breadth of the tape; said apparatus comprising:

substantially planar base means adapted to rest flat against a generally planar surface with one side of said hub means facing outwardly from said planar surface;

hub means on said base means projecting outwardly from said one side of said base means with the axis of said hub means oriented transversely thereto;

said hub means having an outside diameter somewhat smaller than the inside diameter of said annular tape roll whereby said roll may be journaled upon said hub means to maintain a low profile with respect to said planar sur-

face and to rotate freely about said hub means as tape is pulled off said roll;

means extending substantially parallel to said base means and slidably engaging a non-adhesive side of said tape for imparting a twist in said tape;

and means including a tape-retaining surface extending substantially parallel to said base means for retentively engaging an adhesive tape-retaining surface at some distance from said base means and at some radial distance from the outer circumference of said tape roll;

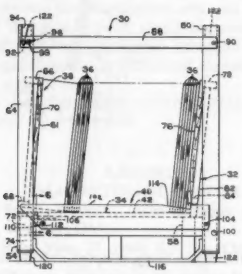
said distance of said tape-retaining surface from said base means being of the same order of magnitude as the breadth of said tape.

4,320,836

FLAT GLASS SHIPPING RACK

William J. Brown, Lower Burrell, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 31, 1979, Ser. No. 108,768
Int. Cl.[3] B65D *85/48*
U.S. Cl. 206—451 25 Claims



1. A rack for shipping sheets, comprising:

a base having a front half portion and a rear half portion;

a pair of vertical standards mounted in spaced relation to one another on the rear half portion of said base and extending above said base;

a pair of vertical legs mounted in spaced relation to another on the front half portion of said base, said pair of legs having a height less than the height of said pair of standards;

a planar sheet supporting member having a configuration and cross-sectional area;

means for securing said planar sheet supporting member to said pair of standards to support the sheets to be shipped in a generally vertical position;

a planar sheet retaining member having a configuration and cross-sectional area similar to that of said planar sheet supporting member;

a pair of elongated vertical members mounted in spaced relation to one another to said planar sheet retaining member;

means for detachably securing said pair of elongated vertical members to said pair of legs to position said planar sheet retaining member in spaced facing relationship to said planar sheet supporting member; and

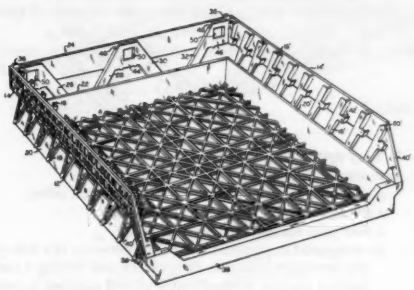
means mounting said pair of vertical standards and said pair of elongated vertical members and detachably secured to at least one of said pair of vertical standards or said pair of vertical members for maintaining said planar sheet retaining member in a fixed spaced relationship to said planar sheet supporting member.

4,320,837

NESTING AND STACKING CONTAINER

James C. Carroll, and Lewis T. Johnson, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 944,813, Sep. 22, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 200,721
Int. Cl.[3] B65D *21/04*
U.S. Cl. 206—505 14 Claims



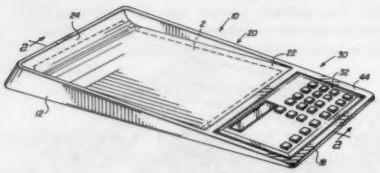
1. In a generally rectangular container, adapted to stack and to nest with an upper container of like construction, having opposed, vertical side walls and a vertical rear wall, comprising: lower side rails and a lower rear rail, respectively, all terminating at their bottoms in a single, horizontal bottom plane, all terminating at their tops in a single, horizontal intermediate lower plane, all having their inner upper edges beveled and all disposed in respective first vertical planes and upper side rails and an upper rear rail, respectively, all terminating at their bottoms in a single, horizontal intermediate upper plane, all terminating at their tops in a single, horizontal top plane and disposed in respective second vertical planes outwardly offset from said first vertical planes; a horizontally disposed bottom extending between and joined to said side walls and said rear wall between said bottom plane and said intermediate lower plane, thereby forming flange portions of said lower side rails and said lower rear rail, respectively, extending below said bottom; and upwardly projecting guide bosses formed adjacent the rear corners of said container and adapted to guide the bottoms of the side walls of said upper container of like construction therebetween during a forward, sliding movement of said upper container of like construction to a stacking position atop the container hereof, the improvement comprising: at least one runner means extending a short distance forwardly from said flange portion of said rear wall and terminating at its bottom at said bottom plane to provide a horizontal slide surface coincident with said bottom plane, the runner means of said upper container of like construction being adapted to slide along the top of said rear wall of said container hereof during said forward, sliding movement of said upper container of like construction to a stacking position atop said container hereof; and a plurality of downwardly projecting cleat means spaced along the bottom of at least the upper rear rail of said upper side rails and said upper rear rail, the cleat means of said upper container of like construction being adapted to rest on the top of said at least the upper rear rail of said upper side rails and said upper rear rail of said container hereof and be supported by said container hereof with the intermediate upper plane of said upper container of like construction substantially coincident with said intermediate lower plane of said container hereof when said upper container of like construction is nested with said container hereof.

4,320,838

CALCULATOR TRAY APPARATUS

Sanford L. Braver, Tempe, Ariz., assignor to BCG, Ltd., Tempe, Ariz.

Filed Jan. 7, 1980, Ser. No. 110,130
Int. Cl.[3] B65D *1/34;* G06C *5/02*
U.S. Cl. 206—564 6 Claims



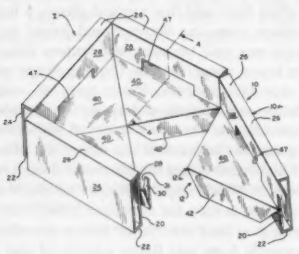
1. Tray apparatus, comprising, in combination:
base means, including
a pair of side walls spaced apart from each other,
a front wall secured to the side walls,
a rear wall secured to the side walls,
an elongated depression extending between the side walls and having a generally flat portion and having a curved portion secured to the front wall and adapted to receive an element having arithmetic entries thereon, and
a first recess for receiving a calculator disposed between the elongated depression and the rear wall; and
a calculator disposed in the first recess for performing arithmetic calculations in response to the arithmetic entries on the element in the depression.

4,320,839

PACKAGING INSERT

Boyd T. Skaggs, Louisville, Ky., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 5, 1980, Ser. No. 203,558
Int. Cl.[3] B65D *81/16, 85/30*
U.S. Cl. 206—591 5 Claims



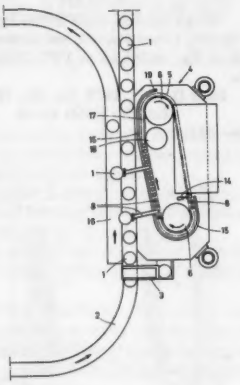
1. A self-locking insert for cushioning a packaged article and spacing it from the walls of an outer container, said insert being formed from a unitary blank of foldable sheet material such as paperboard, and comprising:
(a) an outer frame member including a plurality of hollow walls interconnected at their ends;
(b) each of said hollow walls comprising an intermediate panel, a first edge panel, an outer panel, a second edge panel, and an inner panel foldably joined to each other to form a hollow rectilinear structure;
(c) a deck member extending between said hollow walls intermediate the planes of said first and second edge panels and including a plurality of pie-shaped sections disposed adjacent each other;
(d) each of said deck member sections comprising:
(i) a main panel foldably joined at an outer side edge to an adjacent edge of a related hollow wall inner panel and extending inward therefrom and normal thereto;
(ii) a pair of flange panels foldably joined to inner edges of said main panel and extending normal thereto in face-to-face relation with flange panels of adjacent main panels.

4,320,840

DEVICE FOR CULLING ARTICLES SUCH AS PACKAGE UNITS IDENTIFIED AS DEFECTIVE

Karl-Heinz Braschos, Goldener Spiegel 13, D-5900 Siegen 1, Fed. Rep. of Germany

Filed Apr. 1, 1980, Ser. No. 136,342
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924312
Int. Cl.[3] B07C *5/00*
U.S. Cl. 209—523 12 Claims



1. Apparatus for discharging selected articles laterally from a main horizontal conveyor, comprising an endless conveyor on which is mounted a series of pushers for vertical swinging movement between a raised inactive position and a lowered active position, said endless conveyor converging at an acute angle with the main conveyor in the direction of travel of the main conveyor, and means for selectively individually lowering each said pusher into registry with an article to be discharged from the main conveyor as said main and endless conveyors converge.

4,320,841

DETECTION AND SORTING SYSTEMS

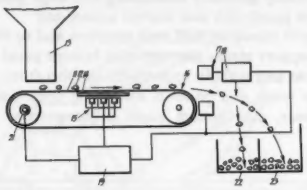
Hilton P. Gordon, Johannesburg, South Africa; Arthur W. Richards, Plenty, Australia; Albert P. Hawkins, Caulfield, Australia, and Alan Boyle, Warrandyte, Australia, assignors to Sphere Investments Limited, Nassau, The Bahamas

Filed Oct. 16, 1978, Ser. No. 951,952
Claims priority, application South Africa, Jun. 5, 1978, 78/3198
Int. Cl.[3] B07C *9/00*
U.S. Cl. 209—552 20 Claims

1. A method of sorting objects according to the degree to which they possess a certain characteristic comprising:
passing the objects in a line at known speed along a path which causes them successively to pass a plurality of detectors spaced apart along said path and each responsive to said characteristic whereby to derive from each detector a time sequence of output signals dependent on the degree to which successive objects possess said characteristic;
scanning the objects as they move along said path so as to derive a time sequence of scanning signals which, based on said known speed of the objects, are indicative of the

positions occupied by the objects throughout their movement along said path;

deriving control signals each dependent on an accumulation of a signal dervied from the last detector in the direction of movement at a time indicated by the scanning signal to be a time of passage of an object past that last detector and the signal derived from each preceding detector at a time indicated by the scanning signals to be a time of passage of the same object past that preceding detector, the signals derived from all detectors being continuously accumu-



lated such that each signal derived from said last detector is accumulated with the signal derived from each preceding detector at a time equal to D/V before the derivation of said signal from the last detector, where D is the distance between said last detector and said preceding detector and V is said uniform speed of movement of the objects, and said scanning signals being used to cause gating of the continuously accumulated signals to derive said control signals; and

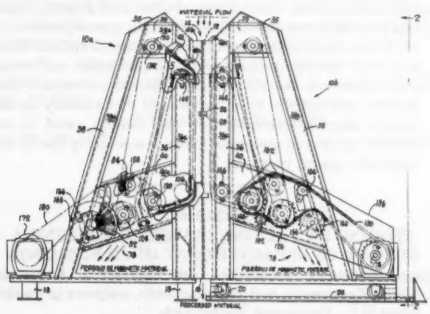
using said control signals to control sorting of the objects as they move from said path.

4,320,842

MAGNETIC SEPARATOR

Edward H. Rudd, Wooster, Ohio, assignor to Magni-Power Company, Wooster, Ohio

Filed Mar. 27, 1980, Ser. No. 134,682
Int. Cl.³ B07C 5/34
U.S. Cl. 209—636 **10 Claims**



1. A magnetic separator, comprising:

(a) structure forming a passageway that defines a flow path for material to be processed;

(b) a plurality of spaced, magnetically permeable elements movable along at least one inside wall of said passageway, said elements extending substantially transverse to the direction of the material flow;

(c) first conveyor means comprising an endless chain to which the elements are attached, for transporting said elements through said passageway, along said inside wall;

(d) magnetic means for inducing magnetism in said elements, said magnetic means movable along an outside wall of said passageway, in juxtaposed relationship with said elements;

(e) second conveyor means comprising an endless chain to which the magnetic means is attached, for moving said magnetic means in synchronism with said elements; and,

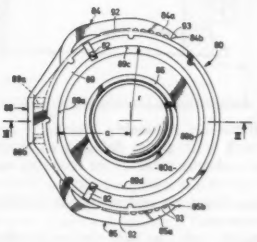
(f) drive means for driving said conveyors.

4,320,843

FOR BOTTLE OR THE LIKE, COMPRISING TEARABLE TENSIONING MEANS AS WARRANTY

Werner F. Dubach, Hubrainstrasse 4a, 8124 Maur, Switzerland

Filed Mar. 31, 1980, Ser. No. 135,319
Claims priority, application Switzerland, Mar. 30, 1979, 2973/79
Int. Cl.³ B65D 41/48
U.S. Cl. 215—256 **8 Claims**



1. A closure for hermetically sealing and for easily resealing a bottle or a similar container, which bottle comprises a neck with a discharge orifice, a neck end surface surrounding said orifice and a mouth lip having a constriction at its lower side, said closure comprising a cap having a roof wall and a cap side wall circumferential to said roof wall and comprises slits extending transversely from the lower rim of said cap and being adapted for spreading when said cap is set on the mouth of the bottle, said cap further comprising an inside annular rim on the inside of the cap side wall projecting inward and being adapted for engaging the lower side of the mouth lip of the bottle, when in closed condition, a sealing means is mounted to the inside of the roof wall for sealing the discharge orifice of the bottle when closed by said cap, a finger-actuated lift-off element in a sector of said cap side wall which sector serves as actuation side, and a fastening device associated with said slits and comprising, for each slit present in the cap side wall, at least one tensioning member curvedly bridging such slit, said tensioning member having two ends each of which ends merge with said cap side wall on opposite sides of the bridged slit, at least one of said ends of said tensioning member being connected in a sector of the cap side wall away from the actuation side, said tensioning member being tensioned in the closed condition by a stretching force tangential to the cap side wall and thus effecting a compression of every slit present in the side wall and thereby a sealing pressure of the inside annular bead against the lower side of the mouth lip of the bottle neck; the tensioning member of at least one slit further comprising, at at least one of its said tension member ends and at least on that side of said slit bridged thereby which is located in a sector of the cap side wall away from the actuation side, at least one tear-up strap of reduced cross section by means of which strap said tension member end is connected to said cap side wall and which strap can be torn away from said cap side wall, when the closure, after being mounted on a bottle for the first time, is opened for the first time, whereby the tangential stretching and hence the ensuing compression of the particular slit is alleviated; and the cap can be reseated more easily on the bottle to close the latter after the first opening.

4,320,844

RELEASABLE LOCKING SYSTEM

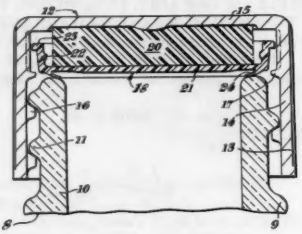
Michael F. A. Cooper, 13 Waverley Close, Kidderminster, Worcestershire, England

Filed Jun. 6, 1977, Ser. No. 803,998

Claims priority, application United Kingdom, Jun. 10, 1976, 23957/76; Jun. 19, 1976, 25519/76; Aug. 11, 1976, 33345/76

Int. Cl.[3] B65D *51/16, 53/00, 55/12*

U.S. Cl. 215—260 1 Claim



1. Apparatus for releasably locking a container member having a neck with a rim defining an opening at one end thereof and a closure member for covering said opening comprising:

first means being on said container member for providing first surfaces;

second means being on said closure member for providing second surfaces registrably engageable with said first surfaces and for effecting a fastening closure between said members;

a liner interposed between said closure member and container rim having a planar disc substantially coextensive with said container opening with a depending peripheral resilient ring engageable with the rim of the container neck surrounding said container opening; the edges of said ring being deflectable towards said disc upon engagement with said container rim;

third means for movably supporting said liner in said closure member;

a spring member being between said liner and the inner surface of said closure member to resiliently urge said liner towards said rim and resiliently yieldable to provide fluid escape under a predetermined fluid pressure and thereby prevent fluid pressure in the container from exceeding said predetermined pressure.

4,320,845

COLLAPSIBLE CONTAINER

John G. Waller, 140 Old Fairburn Close Rd., Atlanta, Ga. 30303

Continuation-in-part of Ser. No. 967,300, Dec. 7, 1978, abandoned. This application Mar. 12, 1980, Ser. No. 129,712

Int. Cl.[3] B65D *6/18, 21/02*

U.S. Cl. 220—6 26 Claims

1. A collapsible container comprising: side wall members, each including a rectangular side wall and a corner portion, said corner portion projecting inwardly from one end of said side wall;

(a) an opposed generally parallel pair of side wall members, each including a rectangular side wall and a corner portion, said corner portion projecting inwardly from one end of said side wall;

(b) a pair of opposed generally parallel rectangular additional wall member;

(c) first pivot means pivotally connecting side edge portions of said additional wall members respectively with the corner portions of said side wall members, and the other side edge portions of the said additional wall members respectively with the other ends of said side walls;

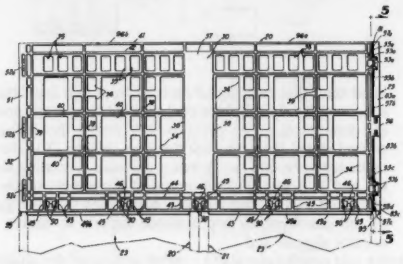
(d) said first pivot means defining parallel vertically extending axes, the pivot axis between said corner portion of each side wall member and an additional wall member being spaced inwardly of the inner surface of the side wall of that side wall member;

(e) a generally flat bottom panel;

(f) journal means on the lower edge portions of said one of the aforesaid wall members;

(g) second pivot means being loosely journalled by said journal means and being moveable vertically in said journal means, said second pivot means protruding into said journal means and loosely pivotally connecting one edge portion of said bottom panel with said journal means; and

(h) support means on said wall members and so disposed that said support means supports said bottom panel by its edge portions and without appreciable support from said journal means when said panel is across the open bottom of the container, said bottom panel pivoting from its position



across the open bottom of the container to a position adjacent said one of said wall members, said wall members pivoting toward each other to a flattened condition for sandwiching said bottom panel therebetween, when said bottom panel is adjacent to the associated wall member;

(i) said journal means having a first portion thereof inwardly of portions of said pivot means for arresting inward movement of said pivot means for thereby normally preventing said pivot means from being removed from said journal means, said journal means also having vertically spaced portions for confining movement of said pivot means in a vertical direction, said spaced portions being spaced apart sufficiently that, when said bottom panel is disposed across said open bottom, substantially all of the weight downwardly on said bottom panel is transmitted by said bottom panel to said support means and said pivot means is essentially free of said vertically spaced portions.

4,320,846

STORING OR PACKING DEVICE COMPRISING A NUMBER OF SEPARATE CONTAINER ELEMENTS

Samuel Meyering, Amsterdam, and Engelbertus J. van der Molen, Krommenie, both of Netherlands, assignors to Vandermolen B.V., Purmerend, Netherlands

Filed Oct. 22, 1979, Ser. No. 87,158

Claims priority, application Netherlands, Nov. 2, 1978, 7810935; Belgium, Aug. 31, 1979, 196977

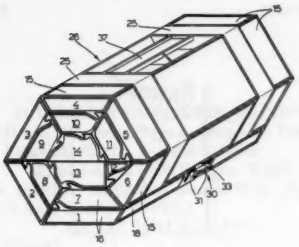
Int. Cl.[3] B65D *37/00, 85/67*

U.S. Cl. 220—20 24 Claims

1. A device for storing or packing loose objects, comprising a plurality of substantially rigid container elements of equal length and of varying width, each of said elements including a flat bottom wall having substantially parallel side edges, and end walls and side walls extending upwardly from said bottom wall, said end walls and side walls of at least the majority of said elements having upper edges situated in a common flat plane and defining the element upper side, and hinge means hingedly interconnecting said plurality of container elements so as to form a unitary continuous row of said elements, at least

the majority of said hinge means being arranged at said bottom wall parallel side edges of said elements,

said row of hingedly interconnected container elements having a first end and a second end and said element row being moveable between a first extended open position in which said container elements rest on their bottom walls with said element upper sides turned upwardly, and a second, rolled-up closed position in which said element row, starting from said first end thereof has been spirally



rolled-up from said first position to form a substantially closed block of prismatic shape and comprising polygonal convolutions, in which block each element, except for said first element, at its side turned towards said first element, is in abutting relation to the adjacent element hingedly connected thereto, and in which block each of said majority of elements of varying widths has its said upper side matingly engaged and covered by at least one pre-determined wall portion of corresponding size of at least one element situated radially inwardly thereof.

4,320,847

CONTAINER FOR RECEIVING AND STORING SPENT FUEL ELEMENTS

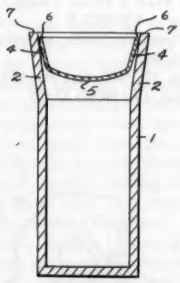
Gernot Gesser, Ludwigstrasse 157, 6450 Hanau 7; Franz Hauer, Hofer-Weg 44, 6367 Karben 6; Berthold Racky, Johannesweg 7, 6369 Nidderau 1, and Dieter Klein, Heinrich-Heine-Strasse 9, 6036 Friedberg, all of Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,108

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2930991

Int. Cl.³ B65D *6/34, 8/04, 8/06*

U.S. Cl. 220—67 **4 Claims**



1. A container adapted to receive and store spent fuel elements consisting essential of a metal can and an inwardly curved cover having a torispherical head, said can having a frusto conical widening region at the upper end thereof and the cover above the torispherical head also having a frusto conical region, there being formed between the two conical regions at the place of contact an acute angle (α) of 1°–7°, the frusto conical widening of the can forming an angle (β) of 3°–10° to the extension of the surface of the line of the can.

4,320,848

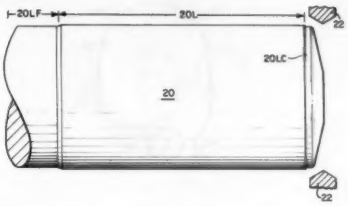
DEEP DRAWN AND IRONED PRESSURE VESSEL HAVING SELECTIVELY CONTROLLED SIDE-WALL THICKNESSES

Richard G. Dye, 4 Wilderness Trail, Warren, N.J. 07060, and Arthur W. Robichaud, 1 Hook Harbor Rd., Atlantic Highlands, N.J. 07716

Filed Jun. 7, 1979, Ser. No. 46,157

Int. Cl.³ B65D *7/42*

U.S. Cl. 220—72 **10 Claims**



1. A pressure vessel including a drawn and ironed elongated metal shell with a plurality of stepped internal diameters having a seamless drawn closed end having a first wall thickness, a first axial portion immediately adjacent said closed end having a second wall thickness effected by one of said stepped internal diameters, a second axial portion immediately adjacent said first axial portion and having a third wall thickness effected by another of said stepped internal diameters, and a fourth axial portion immediately adjacent said third axial portion and having a fourth wall thickness effected by a further one of said stepped internal diameters.

4,320,849

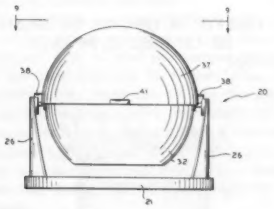
FOOD SERVING CONTAINER

Bernard Yellin, 6 Oak Brook Club Dr., Oak Brook, Ill. 60521

Filed Sep. 29, 1980, Ser. No. 191,806

Int. Cl.³ B65D *43/14*

U.S. Cl. 220—252 **8 Claims**



1. A food serving container comprising a base having a pair of spaced upright standards, each of said standards having a first substantially U-shaped flange and a second substantially U-shaped flange, both of said flanges being inwardly directed with the second flange being disposed within said first flange and defining a space therebetween, a container bowl having a pair of diametrically spaced outwardly directed projections each received between the legs of a respective second U-shaped flange and supported on said standards, a cover having a pair of diametrically spaced outwardly directed arcuate flanges, the arcuate flanges of the cover being rested on the legs of respective second U-shaped flanges when the cover is superposed on said bowl and providing a closure for the bowl, said cover being rockable to underpose said cover in relation to

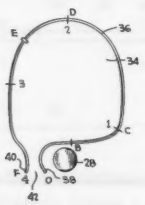
said bowl thereby to open said bowl for removal of contents from the bowl, said arcuate flanges when the cover is in underposed position being rested on said first U-shaped flanges.

4,320,850

EASY OPENING END UNIT WITH TAPERED SCORE

Fred W. Drolen, Jr., Worth, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 24, 1980, Ser. No. 200,234
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 **8 Claims**



1. In an easy opening end unit of the non-detachable tab type for a beverage can wherein said end unit has a displaceable panel portion defined by a generally oval score having adjacent side-by-side spaced end portions defining a hinge permanently connecting said panel portion to the remainder of said end unit, said score and said tab having a relationship wherein the force required to continue the rupture of said score after opening remains high and then having a normal tendency to suddenly decrease, and said score becoming progressively shallower to define an increasing residual, said increasing residual defining means for resisting the undesired sudden decrease in force required to rupture said end unit and resultant rapid swinging of said panel portion into contact with a beverage underlying said end unit and the resultant foaming and splashing of the beverage, said score including a beginning half and an ending half, and said score becoming progressively shallower in said ending half.

4,320,851

TRASH CAN LID HAVING SECURING MEANS

Joseph D. Montoya, P.O. Box 5834, South Lake Tahoe, Calif. 95729

Filed Feb. 20, 1981, Ser. No. 236,314
Int. Cl.³ B65D *45/16, 45/28*
U.S. Cl. 220—324 **12 Claims**

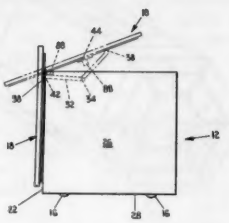
1. The method of removably securing container lids upon a container comprising: providing a pair of diametrically opposed openings adjacent the exterior circumference of a container lid; fixedly installing a pair of loops on the upper inner edge of the container which loops are cooperative with and extend through the diametrically opposed openings; securing a pair of draw bolts to the exterior of the lid in alignment with said loops in such manner that the draw bolts may be inserted through the loops or may be withdrawn from them, exterior of the outer surface of the lid.

4,320,852

MOBILE FILE LID

Preston Nagelkirk, Zeeland, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 31, 1980, Ser. No. 202,714
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 220—331 **11 Claims**



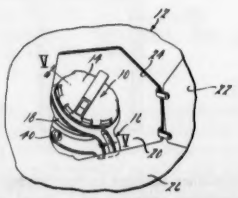
1. A top-access cabinet comprising:
a front wall, a rear wall and two side walls;
a cover pivotably mounted to said cabinet along a pivot axis at the rear of the cabinet;
hinge means for mounting the cover for pivotal movement about the pivot axis between an open and closed position;
said hinge means including
a first flange secured to said cabinet rear wall;
a second flange pivotably mounted to said first flange;
means for slidably mounting said cover to said second flange so that said cover is translatable rearwardly with respect to said front wall; and
means for guiding movement of said cover with respect to said rear wall so that said cover means moves rearwardly only as it pivots about said pivot axis from a horizontal position overlying the cabinet to a substantially vertical position;
whereupon as said cover is pivoted from a horizontal to the substantially vertical position said cover moves from a position overlying the cabinet to a position at least partially behind the cabinet rear wall.

4,320,853

CAP ASSEMBLY FOR A FUEL TANK IN A MOTOR VEHICLE

Donald E. Moore, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 25, 1980, Ser. No. 190,692
Int. Cl.³ B65D *55/16*
U.S. Cl. 220—375 **9 Claims**



1. A fuel cap assembly for a motor vehicle comprising:
a fuel cap constructed to sealingly engage a filler spout;
a tether connectable at a first end thereof to the fuel cap and at a second end thereof to the motor vehicle;
said tether being flexurally stiff enough to counter the force

of gravity exerted on said fuel cap to maintain said cap in a suspended position away from said motor vehicle when disengaged from said filler spout.

4,320,854

AUTOMATIC CASH ISSUE MACHINE

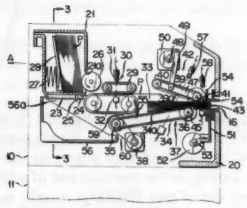
Minoru Hirose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 18, 1979, Ser. No. 58,439

Claims priority, application Japan, Jul. 26, 1978, 53-102669[U]; Aug. 2, 1978, 53-94333

Int. Cl.³ B65H *3/02, 29/12*

U.S. Cl. 221—12 4 Claims



4. An automatic cash issue machine for issuing paper notes in response to a customer command, comprising:

(a) a machine body having a cash discharge port at one side thereof;

(b) a paper note stocker within the machine body for storing paper notes;

(c) a take-out mechanism, disposed at one side of the paper note stocker for successively removing paper notes therefrom;

(d) a recovery receptacle, disposed in said body, and having an opening through which paper notes collected therein can be removed;

(e) a temporary cash collecting section for accumulating paper notes successively removed from the paper note stocker by the take-out mechanism and having one end thereof extending near the cash discharge port and another end thereof extending to the recovery receptacle;

(f) reversible transporting means, operable in a first direction, to forward paper notes from the temporary cash collecting section to the cash discharge port, and, operable in a second direction opposite to the first direction, to carry paper notes from the temporary cash collecting section to the recovery receptacle;

(g) nipping means movable between a fallen position and a raised position and operatively associated with the transporting means, said nipping means being operable in the fallen position to nip accumulated paper notes and being operable in the raised position to release paper notes previously nipped; and

(h) a shutter for selectively closing the cash discharge port, and for aligning the leading edges of paper notes being accumulated in the temporary cash collecting section by having them brought into contact with the shutter.

4,320,855

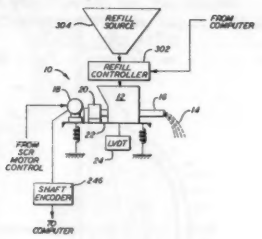
WEIGH FEEDING APPARATUS

Ronald J. Ricciardi, Garfield; Angelo Ferrara, Fairfield; Joseph L. Hartmann, West Caldwell, and Gary R. Lauterbach, Livingston, all of N.J., assignors to Acrison, Incorporated, Moonachie, N.J.

Continuation of Ser. No. 907,960, May 22, 1978, which is a continuation of Ser. No. 748,397, Dec. 7, 1976, Pat. No. 4,111,272. This application Feb. 28, 1980, Ser. No. 125,370

Int. Cl.³ B67D *5/08;* G01G *19/52, 23/10;* G06F *15/20*

U.S. Cl. 222—56 36 Claims



1. A weigh feeding machine comprising

a container for a substance;

discharge means for discharging the substance from the container at a controllable feed-out rate;

means for producing a first electrical signal corresponding to the desired feed-out rate;

means for sensing the weight of at least the substance in the container and for producing a second electrical signal having a characteristic which is proportional to the value of said weight;

means for sampling said second electrical signal during each of a succession of time intervals;

means for computing a feed-out rate from signals derived from said sampling and for comparing an electrical signal representative of said computed feed-out rate with the first electrical signal, and for producing, as a result of said comparison, a control electrical signal indicative of the desired changes, if any, in the feed-out rate of the discharge means;

control means for controlling the discharging means in accordance with said control electrical signal to thereby maintain the feed-out of the substance from the container at the desired feed-out rate; and

means for comparing a signal derived from at least one sample taken during one of said time intervals with a signal derived from at least one sample taken during another of said time intervals, for repeating said comparison for successive time intervals, so that the signal derived during each of said successive time intervals is compared with a signal derived during a different time interval, and for inhibiting the action of the control electrical signal on the control means when said comparison shows a difference between the compared signals beyond a predetermined limit.

4,320,856

SPHERICAL VACUUM INSULATED CONTAINER

Herbert M. Stewart, Nashville, and Jack W. La Fevor, Lebanon, both of Tenn., assignors to Aladdin Industries, Incorporated, Nashville, Tenn.

Filed Feb. 19, 1980, Ser. No. 122,372

Int. Cl.³ B67D *5/54*

U.S. Cl. 222—131 10 Claims

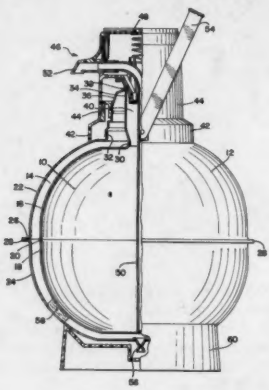
1. In combination, an insulated beverage container having a mouth through which beverages pass into and out of the interior of the container and a pump dispenser removably engaging said container and sealing the mouth of said container,

whereby beverages within the container are dispensed by said pump dispenser, said insulated container comprising:

a substantially spherical metal inner vessel having an opening for filling and emptying said vessel,

a substantially spherical metal outer vessel concentrically enclosing said inner vessel and having an opening aligned with said opening in the inner vessel,

a means for forming an airtight seal between said opening in the inner vessel and opening in the outer vessel, forming the mouth, thereby said mouth creating an airtight chamber between said vessels from which air is substantially



evacuated, said forming means comprising a metal collar welded to said outer vessel and to a neck connected to said inner vessel adjacent their respective openings, said collar receiving said pump dispenser to secure same to said container, and

means for supporting and stabilizing the inner vessel with respect to the outer vessel, wherein said inner and said outer vessels each comprise an upper hemisphere and a lower hemisphere welded together to define a seam, wherein the inside surface of said inner vessel at said seam has a minimum of surface contour, and a separate cap means for enclosing the seam about the outer vessel.

4,320,857

DEVICE FOR THE MELTING AND MEASURED DISCHARGE OF A THERMOPLASTIC ADHESIVE

Armin Herb, Peissenberg, and Erich Leibhard, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

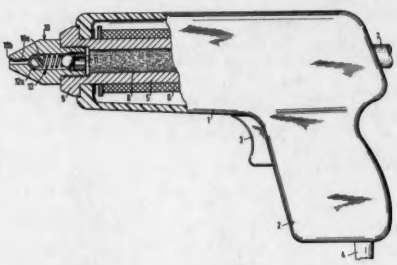
Filed Feb. 20, 1980, Ser. No. 122,848

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906922

Int. Cl.³ B67D 5/62

U.S. Cl. 222—146 HE **3 Claims**

1. Device for the melting and measured discharge of a thermoplastic adhesive material comprising an elongated melting chamber having an inlet at one end and an outlet at the other end thereof with said inlet and outlet spaced apart in the elongated direction thereof, a discharge nozzle fitted to the outlet end of said melting chamber, said discharge nozzle being axially elongated and having an inlet at one end thereof in communication with the outlet end of said melting chamber for receiving melted thermoplastic material therefrom and an outlet end for discharging the melted thermoplastic material from said nozzle, a valve located within said discharge nozzle comprising a valve body positioned at the inlet end thereof and means for biasing said valve body into sealing contact with the inlet into said discharge nozzle for preventing flow of the melting thermoplastic material into said discharge nozzle until a force is applied against said valve body for displacing said valve body against said biasing means for permitting flow of the melted thermoplastic material into said discharge nozzle for flow from the outlet end thereof, wherein the improvement comprises means within said discharge nozzle for maintaining the flow of the melted thermoplastic material from the inlet end to the outlet end of said discharge nozzle when said biasing means fail and are unable to return said valve body into position for sealing off flow from said melting chamber into said discharge nozzle, said discharge nozzle forming an axially elongated passageway extending from said inlet end thereof toward said outlet end for flowing the melted thermoplastic material from said melting chamber toward said outlet end of said nozzle, said biasing means comprising an elongated spring retained within and extending in the axial direction of said



passageway, and said spring arranged to form a stop for spacing said valve body from the end of said passageway opposite said inlet end of said discharge nozzle so that said valve body is held from seating in the opposite end of said passageway and blocking flow out of said discharge nozzle, said spring being a helical spring having a plurality of first turns each located in a plane extending transversely of the axis of said passageway and at least one second turn located at the end of said spring spaced from the inlet end of said discharge nozzle for axially spacing said spring and valve body from the opposite end of said passageway so that even upon failure of said spring the combination of said spring and valve body does not block flow of the melted thermoplastic material through and out of said passageway.

4,320,858

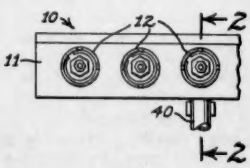
HOT MELT ADHESIVE APPLICATOR

Jeffrey L. Mercer, Gallatin, and James B. White, Nashville, both of Tenn., assignors to Mercer Corporation, Hendersonville, Tenn.

Filed Mar. 13, 1980, Ser. No. 130,135

Int. Cl.³ B67D 5/62

U.S. Cl. 222—146 HE **8 Claims**



1. An applicator apparatus for dispensing hot melt adhesive comprising:

(a) a dispenser head having first and second opposed end portions,

(b) a cartridge cavity within said head and opening through said first end portion,

(c) a liquid chamber formed within, and structurally a part

of, said head, and having an opening through said second end portion,

(d) nozzle means having an orifice mounted in said opening,

(e) a stem passage formed within, and structurally a part of, said head, and extending between said cartridge cavity and said liquid chamber,

(f) a liquid passage in said head in fluid communication with said liquid chamber and adapted to communicate with a source of liquid,

(g) an air passage in said head in fluid communication with said cartridge cavity and adapted to communicate with a source of compressed air,

(h) a modular valve cartridge removably mountable in said cartridge cavity in operative position,

(i) said cartridge comprising a valve body and a valve stem operable in said valve body,

(j) said valve body having first and second end portions, said second end portion terminating on the opposite side of said stem passage from said liquid chamber, in operative position,

(k) said valve stem projecting from said second end portion of said valve body, through said stem passage and said liquid chamber into said nozzle means for opening and closing said orifice, in said operative position,

(l) said stem passage being just large enough in cross-section to receive only said valve stem for coaxial reciprocable movement,

(m) valve actuator means within said valve body for controlling said valve stem to open said orifice in response to an increase in air pressure, and

(n) an air port within said valve body in fluid communication between said air passage and said valve actuator means, in said operative position.

4,320,859

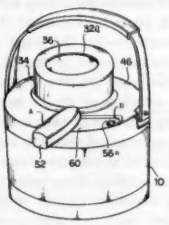
INSULATED BUCKET WITH AIR PUMP

Min C. Shy, No. 20, Alley 18, Lane 109, Hoping St., Yang Ho City, Taipei, Taiwan

Filed Jun. 4, 1980, Ser. No. 156,527

Int. Cl.³ F04B *43/02*; B65D *47/34*; B67D *5/42, 5/54*

U.S. Cl. 222—401 **4 Claims**



1. A heat insulated bucket including air compressing means for dispensing liquid therefrom, comprising:

a bucket body having an opening centrally located at the upper end thereof, said opening having screw threads on the inner wall thereof and an annular ledge adjacent its lower end;

a stopper member seated on said annular ledge, said stopper member having a hole extending therethrough facilitating air communication with the inside of said bucket body;

said air compressing means including an elastic pouch fastened on top of said stopper member in said opening of bucket and provided with an exhause exit at its lower end in communication with said hole of said stopper member;

an L-shaped delivery tube rotatably mounted in the top of said bucket body with one end of said tube depending down into the inside of said bucket body to bottom or floor thereof and the other end of said tube including an outlet extending outside of said bucket body for rotation to and away from above the top of said bucket body; and

a cap member shiftably mounted in the top of said body bucket and yieldable means urging said cap member against said outlet of delivery tube when said other end thereof is rotated to the closed position.

4,320,860

GRAIN DELIVERY ATTACHMENT FOR TAILGATE

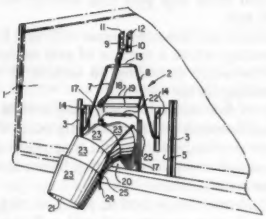
Willard Koch, P.O. Box 252, and Melvin R. Koch, P.O. Box 472, both of Three Hills, Alberta, Canada (T0M 2A0)

Filed May 27, 1980, Ser. No. 153,568

Claims priority, application Canada, Aug. 2, 1979, 333082

Int. Cl.³ B65D *47/00*

U.S. Cl. 222—502 **4 Claims**



1. A dual mode, grain delivery mechanism for use on a wall of a dump truck or other vehicle of the type which includes a large discharge opening through which grain can be dumped rapidly from the vehicle in a first mode, said mechanism comprising first gate means slidably mounted on said vehicle wall for ready sliding movement back and forth between a closed position covering said large discharge opening and an open position for rapid grain delivery; a smaller discharge opening in said first gate means aligned with a portion of said large discharge opening when the first gate means is in the closed position; second gate means slidably mounted on said first gate means for ready sliding movement back and forth between a closed position covering said smaller discharge opening and an open position for slower grain delivery in a second mode; and chute means movably mounted on said first gate means in front of said second gate means for directionally discharging grain from the vehicle when the first gate means is in the closed position and said second gate means is in the open position.

4,320,861

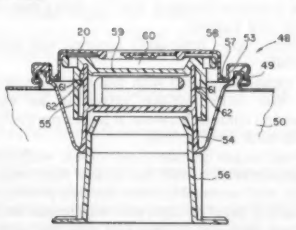
MOLDED PLASTIC TAMPER-PROOF CAP WITH PULL RING AND TEARABLE MEMBRANES

Mahlon E. Rieke, Auburn, and Kenneth L. Summers, Angola, both of Ind., assignors to Rieke Corporation, Auburn, Ind.

Filed May 12, 1980, Ser. No. 148,768

Int. Cl.³ B65D *47/10*

U.S. Cl. 222—541 **5 Claims**



1. A tamper-proof cap for a container closure device for providing a visual indication of any tampering and tampering

attempts with said container closure device, said container closure device being of the type having an annular anchor ring for securing the closure device to the container, said tamper-proof cap comprising:

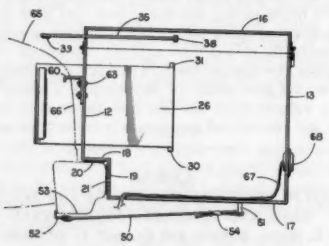
(a) an annular body portion having:
  (1) an enclosing wall,
  (2) an inwardly extending lid section joined to a first edge of said enclosing wall, and
  (3) an outwardly extending lip section joined to a second edge of said enclosing wall;
(b) a pull ring portion detachably joined to the inwardly extending lid section of said annular body portion;
(c) a tear-out strip portion joined to said pull ring portion and integrally joined as part of said annular body portion;
(d) said tear-out strip portion having:
  (1) a first portion extending outwardly across a portion of said inwardly extending lid section of said annular body portion from said pull ring portion to said enclosing wall, and
  (2) a second portion continuous with said first portion and extending across a portion of said enclosing wall from said inwardly extending lid section to said outwardly extending lip section;
(e) a pair of first tearable connecting membranes integrally disposed between said tear-out strip portion and said annular body portion, said tear-out strip portion being separable from said inwardly extending lid section and from said enclosing wall; and
(f) a pull tab member joined to said pull ring portion; and
(g) said pull ring portion and said pull tab member each having an uppermost surface which is substantially coplanar with the uppermost surface of said lid section.

4,320,862

AUTOMOBILE REAR BAGGAGE CONTAINER

Merle M. Bettenhausen, 1019 Hollywood Ct., Indianapolis, Ind. 46234

Filed Jun. 12, 1980, Ser. No. 158,704
Int. Cl.³ B62R *9/06*; B62D *35/00*
U.S. Cl. 224—42.03 A **1 Claim**



1. A device for transporting baggage comprising:
an automobile including a main body with a rear outer surface and rear bumper;
a box to receive baggage, said box being removably mounted atop said bumper;
fastening means removably securing said box to said automobile;
wall means associated with said box and extending forward to said outer surface providing an aerodynamically blended contour between at least a portion of said box and said outer surface, and;
said wall means includes a pair of side walls extendable from opposite sides of said box to said rear outer surface and a first wall extendable from said top portion of said box to said rear outer surface, said wall means includes magnetic means mounted to said first wall and said side walls to removably secure each to said rear outer surface, said first wall and said side walls are mounted to said box and are flexible to assume a blended contour between said box and automobile, said box is slotted slidably receiving said first wall and said side walls which have enlarged inner ends limiting movement relative to said box.

4,320,863

WEARER ADJUSTABLE ARTICLE CARRYING HARNESS ASSEMBLY

Daniel M. Lyer, and Vicky Lyer, both of P.O. Box 467, Prescott, Ariz. 86301

Filed Sep. 15, 1980, Ser. No. 187,056
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—259 **7 Claims**

1. A carrying harness assembly means adapted to releasably position an article against the front midsection of the wearer when in a carrying position and for permitting selective eye level positioning of the article in an operating position comprising:
a pair of length adjustable front straps each with a lower end for attachment to the article and each with an upper end;
an upper back strap means extending across the upper back of the wearer having an end extending over each shoulder of the wearer for movable attachment to a respective upper end of said pair of straps through rigid rings means;
a length adjustable central back strap movable connected to said upper back strap intermediate the ends thereof extending downward toward the waist of the wearer;
a waist band connected to said central back strap and extending at least partially around the wearer; and
a pair of article attachment straps each having first and second ends, the first end of each article attachment strap being movably connected through rigid ring means to a respective front strap at said lower end and the second end of each article attachment strap being removably attached by cooperating fasteners to said waist band, the article attachment straps each movably connected at said first end to respective opposite sides of the article.

4,320,864

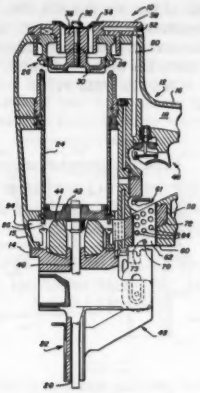
MUFFLER FOR FASTENER DRIVING TOOL

Raymond F. Novak, Itasca, and Bernard W. Geist, Melrose Park, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed May 22, 1980, Ser. No. 152,198
Int. Cl.³ B25C *1/04, 9/00*; F01N *1/10*
U.S. Cl. 227—130 **13 Claims**

1. A muffler for a fastener driving tool wherein said tool includes a housing defining nose and handle portions, a cylinder in said nose portion, said cylinder including upper and lower ends a driver reciprocally mounted in said cylinder, a a chamber defined in said housing in fluid communication with

said lower end of said cylinder, said muffler including a first, tubular muffler element mounted in said chamber, said first



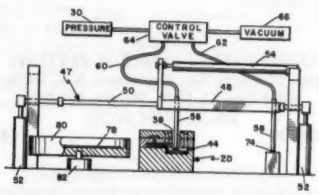
muffler element including at least one aperture in the periphery thereof.

4,320,865

APPARATUS FOR ATTACHMENT OF DIE TO HEAT SINK

Victor A. Batinovich, Los Altos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 21, 1980, Ser. No. 132,791
Int. Cl.³ H01L *21/52;* H05K *3/34;* B23K *31/02*
U.S. Cl. 228—6 A **11 Claims**



1. A system for attaching dies to heat sinks comprising in combination:

a housing defining an elongated tunnel having an inlet at one end and an outlet at the other;

indexing means for indexing support members from said inlet through said tunnel to said outlet;

an access opening in said housing communicating with said tunnel intermediate the ends thereof;

heating means for heating support members in said tunnel to a solder melting temperature;

gas distributing means in said housing for distributing a forming gas throughout said tunnel for preventing entrance of atmospheric air into said tunnel; and

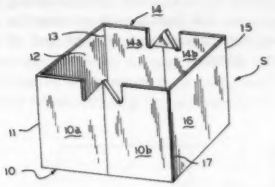
handling means coordinated with said indexing means for selecting and placing a solder pre-form and a die through said access opening onto a support member in said tunnel for bonding said die to said support member.

4,320,866

CONTAINER SLEEVE

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 11, 1980, Ser. No. 167,676
Int. Cl.³ B65D *5/04*
U.S. Cl. 229—37 R **7 Claims**



1. A sleeve formed of a generally rectangular, unitary blank of paperboard, for use in a shipping container, comprising:

(a) opposed pairs of side wall panels foldably joined to each other to form a tubular structure open at the ends;

(b) each side wall panel of one of said pairs including a pair of co-planar panel sections having remote edges foldably joined to adjacent side wall panels and having adjacent edges free from direct attachment to each other;

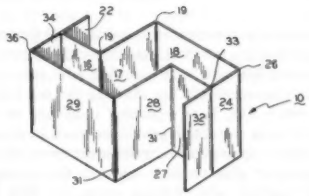
(c) said panel sections having adjacent end portions joined to each other by a connecting panel which is disposed against said end portions and which has a pair of outwardly converging edges foldably joined on diagonal score lines to related outwardly converging edges of said panel sections.

4,320,867

PARTITION STRUCTURE

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 7, 1980, Ser. No. 165,841
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—42 **3 Claims**



1. A partition structure adapted to be disposed in a shipping container for effecting separation of product therein and providing stacking strength of a loaded container, said structure being formed from a cut and scored blank of paperboard and comprising:

(a) a first series of panel elements connected along parallel score lines;

(b) a second series of panel elements connected along parallel score lines;

(c) each of said series of panel elements having at least three foldably connected panel elements;

(d) a pair of connector panels spaced longitudinally of said blank midway thereof and foldably connected to said first and second series of panel elements at proximate ends of first and third of the panel elements thereof on fold lines which are off-set from inner edges of second panel elements, said connector panels being spaced from each

other in a parallel relationship to form a center cell whose interior is generally of a reverse Z shape;

(e) said first and second series of panel elements being connected to said connector panels in reverse image relationship with the first and third panel elements connected to said connector panels in the aforesaid reverse image relationship;

(f) each of said series of panel elements being foldable with respect to the fold lines therein to cause the second panel to move into engagement with an end of a correlative connector panel.

4,320,868

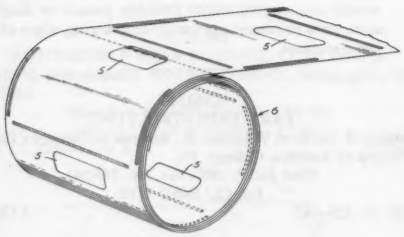
ENVELOPE MATERIAL FOR USE IN ENVELOPE PRODUCING MACHINE

Nils E. Petersson, Nybro, Sweden, assignor to AB Sture Ljungdahl, Nybro, Sweden

Continuation of Ser. No. 835,144, Sep. 21, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,400

Int. Cl.³ B32B *3/10*; B65D *27/10*

U.S. Cl. 229—75 **5 Claims**



1. A length of envelope material adapted for being fed to an envelope-forming machine, said material comprising a succession of envelope units in an unbroken row, each envelope unit having a transverse fold line dividing the unit into two halves along which fold lines separated units can be respectively folded to form respective envelopes, each envelope unit having a window opening and a transparent cover on said opening, first strings of glue on each said unit for joining the halves thereof together after folding along the fold line, further strings of glue joining the transparent cover to said unit, said first strings of glue having a determinable thickness and said further strings of glue together with the transparent cover also having a determinable thickness, said first strings and further strings being on the same side of the material of each unit, the thickness of the glue strings and transparent covers being such as to form equal elevations on the same side of the material, said length of envelope material being wound in a roll having a relatively large inner diameter related to (1) the dimensional length of each envelope unit and (2) the thickness of the envelope material, glue strings and covers, said inner diameter being selected to provide at least three units of envelope material in the innermost winding of the roll, said envelope units being successively juxtaposed in successive windings and offset by equal amounts in the successive windings, said window openings of the successively juxtaposed envelope units in successive windings being partially overlapped in equally spaced relation on said roll whereby said roll is substantially cylindrical.

4,320,869

FLUE GAS TRAP AND DIVERTER

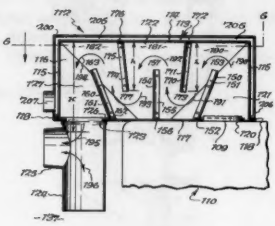
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Continuation-in-part of Ser. No. 866,458, Jan. 3, 1978, Pat. No. 4,215,814. This application Mar. 31, 1980, Ser. No. 135,529

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ F23J *11/02*

U.S. Cl. 236—1 G **11 Claims**



1. A descrete hot gas trap attachment for connection between the outlet flue of a heater in an environ space and a chimney to either vent hot flowing gasses freely from said outlet flue to said chimney or to choke hot passive gasses from said outlet flue to said chimney comprising an elongated horizontal housing including a base plate and a top plate connected to each other by sidewalls for defining a horizontal choke chamber having at least one partition depending from said top plate to partially divide said choke chamber into at least a first compartment and a last compartment connected by a passage near the base plate, a heater connection duct projecting upwardly into said first compartment from the upper side of said base plate for connection to said outlet flue, a chimney leg duct projecting upwardly into said last compartment from the upper side of said base plate, said chimney leg duct having communication with a shroud portion depending from the underside of said base plate with its lower end open to said environ space, said shroud portion having a chimney connection at or below said base plate for venting said outlet flue to said chimney to vent hot flowing gasses freely or for venting said environ space to said chimney to choke hot passive gasses from said outlet flue.

4,320,870

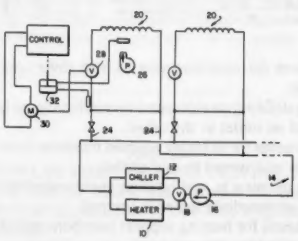
TEMPERATURE CONTROL SYSTEMS

Giora Manor, 19 Kilmer Rd., Larchmont, N.Y. 10538

Filed Dec. 12, 1979, Ser. No. 102,805

Int. Cl.³ F28F *27/00*

U.S. Cl. 236—37 **10 Claims**



1. A temperature control system for maintaining a selected location at a preselected temperature, comprising means for supplying heat transfer fluid, adjustable first control means for controlling the temperature of the heat transfer fluid, heat exchange means for receiving the heat transfer fluid and establishing a heat exchange relationship between the heat transfer fluid and material at said location, adjustable second control

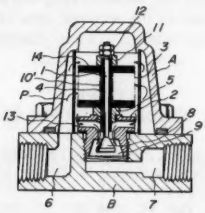
means for controlling the supply of heat transfer fluid to the heat exchange means, and a differential thermostat having a first sensor to sense the temperature at said selected location, a second sensor to sense the temperature of the heat transfer fluid and actuating means operatively connected to said second control means and operative to actuate said second control means to maintain the difference between the temperatures sensed by the first and second sensors at a selected value, whereby adjustment of said first control means causes said preselected temperature to be adjusted accordingly.

4,320,871

BIMETALLIC COLUMN

Masatomo Kuroda, Suita, and Masahumi Minami, Sakai, both of Japan, assignors to Miyazwaki Steam Trap Mfg. Co., Ltd., Osaka, Japan

Filed Dec. 7, 1979, Ser. No. 101,384
Claims priority, application Japan, Dec. 14, 1978, 53-154671
Int. Cl.³ F16T *1/08*
U.S. Cl. 236—59 **5 Claims**



1. In a bimetallic column comprising a plurality of pairs of bimetallic discs superimposed one upon the other and each having a center hole, each pair being separated from adjacent pair by a spacer and comprising two opposed bimetallic discs each composed of two different metal or alloy discs bonded together and, in each pair, the opposed discs are the same in thermal expansion coefficient, said center hole of said bimetallic column being slidably engaged with a stem of a temperature detection operating device connected at its one end to one end of said bimetallic column having the other end slidably supported by a counter part of a valve seat, the improvement comprising; a guide tube of a unitary construction fixedly secured at its lower portion to said valve seat and slidably extending through said center hole of said bimetallic column and projecting out of said bimetallic column, and said stem slidably extending through said guide tube.

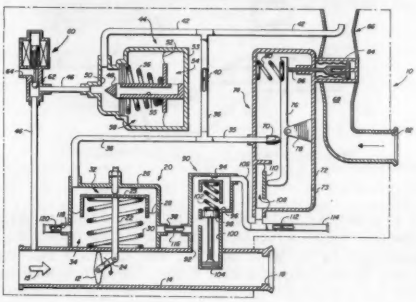
4,320,872

ANTI-ICE CONTROL SYSTEM

Gary L. Frederick, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 5, 1979, Ser. No. 91,028
Int. Cl.³ G05D *23/02*
U.S. Cl. 236—80 A **46 Claims**

17. An anti-ice control system for controlling the flow rate of a heated fluid through a flow path for supply to components subject to icing, comprising a control valve operably positioned along the flow path for controlling the flow rate of heated fluid therethrough; an actuator coupled to said control valve for movably positioning said valve, said actuator including an actuator housing, a diaphragm mounted within said actuator housing for pressure responsive movement, and means connected between said diaphragm and said control valve for positionally adjusting said control valve upon pressure responsive movement of said diaphragm; a reference pressure regulator coupled between said actuator and the flow path upstream of said control valve for supplying a control pressure signal to said actuator for communication with said diaphragm; an ambient air aspirator, said regulator including flow output means coupled to said aspirator for drawing ambient air flow through said aspirator; a servo unit; means including a nozzle within said servo unit for passage of the control pressure signal into said servo unit, said servo unit including a pivotally mounted servo beam for variably opening and closing said nozzle, and reference spring means for predeterminably biasing said beam toward a position closing said nozzle; means responsive to ambient air temperature disposed along said aspirator and including a force arm in bearing engagement with said servo beam in force-opposition to said reference spring for providing a force to said beam as a function of increasing ambient air temperature for moving said beam away from said nozzle for modulating the pressure level of the control signal; and means responsive to the temperature of the heated fluid including pressure responsive means in bearing engagement with said servo beam, heated fluid conduit means coupled between the flow path downstream of said control valve and said pressure responsive means, and variable orifice means along said heated fluid conduit means and responsive to the temperature of the heated fluid in the flow path for varying the available flow area therethrough for supplying a fluid pressure to said pressure responsive means which is modulated as a function of heated fluid temperature for urging said pressure responsive means and said servo beam in force-opposition to said reference spring as a function of increasing heated fluid temperature for moving said servo beam away from said nozzle for modulating the pressure level of the control signal.



4,320,873

CONTROLLED RELEASE AIR FRESHENER USING AN ABSORBENT GENERATOR

Edward J. Martens, III, and Phillip J. Neumiller, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 21, 1979, Ser. No. 40,807
Int. Cl.³ A61K *7/46;* A61L *9/04, 13/00*
U.S. Cl. 239—6 **9 Claims**

1. A method for retarding the rate of evaporation of a volatile perfume from an absorbent substrate in a continuous action air freshener comprising incorporating into the perfume from 10 to 900% by weight, based on the weight of the perfume, of a vapor-control agent selected from the group consisting of nonionic surfactants having an average of from 1 to 5 moles of ethylene oxide per molecule, and mixtures thereof.

4,320,874

BURNER HEAD OF A FUEL-OXYGEN BURNER

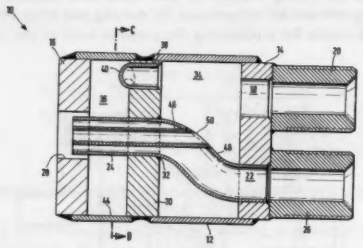
Klaus Leinberger, Willich, and Heinz Golke, Ratingen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 142,869

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916635

Int. Cl.³ B05B 7/10

U.S. Cl. 239—403 11 Claims



1. In a fuel-oxygen burner head including a housing having at one side thereof a fuel intake passage and an oxygen intake passage and having at its opposite side thereof a discharge opening for discharging a torch flame created from a mixture of the fuel and oxygen, the improvement being a first chamber in said housing in flow communication with said oxygen intake passage, a second chamber downstream from said first chamber in flow communication with said discharge opening, a fuel passageway connected in flow communication with said fuel intake passage and extending through said first chamber and into said second chamber for feeding fuel to said discharge opening, means in said first chamber for dividing the oxygen flowing therein into two streams for cooling said burner and permitting the oxygen to mix with the fuel at said discharge opening, said means in said first chamber including a nozzle in flow communication with said second chamber for feeding one oxygen stream thereto to cool said burner, and said means in said first chamber further including a pipe in said fuel passageway communicating at its upstream end with said first chamber and terminating at its downstream end in the general area of said passageway whereby the other stream of oxygen may flow therethrough.

4,320,875

BURNER NOZZLE

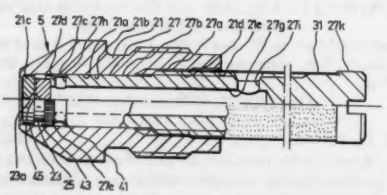
Franz Sutter, Niederdorf, Switzerland, assignor to Institut Straumann AG, Switzerland

Filed Jan. 10, 1980, Ser. No. 111,002

Claims priority, application Switzerland, Jan. 15, 1979, 352/79

Int. Cl.³ F23D 11/38

U.S. Cl. 239—462 25 Claims



1. A burner nozzle comprising an outer body having a longitudinal bore extending therethrough from an entrance end to an exit end for passing a fuel therethrough, a nozzle body mounted in said bore adjacent said exit end, said nozzle body having an orifice coaxially disposed in respect to the axis of said longitudinal bore for passing the fuel, a vortex body mounted in said bore spaced from said outer body to provide a first annular cavity between said outer body and the periphery of said vortex body, said vortex body having a front face designed for reception on said nozzle body, said front face having a tapering pocket immediately adjacent to and in alignment with said orifice and at least one channel interconnecting said first annular cavity and said tapering pocket, and a pin member mounted in said bore, said pin member having a passage for supplying fuel to said nozzle body, said pin member having an annular groove near an end thereof adjacent said vortex body to provide a second annular cavity between said outer body and the periphery of said pin member, said pin member having a surface portion intermediate said second annular cavity and said first annular cavity, said surface portion contacting a surface portion of said outer body bounding said bore, said surface portion having plurality of grooves interconnecting said first annular cavity and said second annular cavity and wherein the sectional area of said grooves is smaller than the sectional area of said channel.

4,320,876

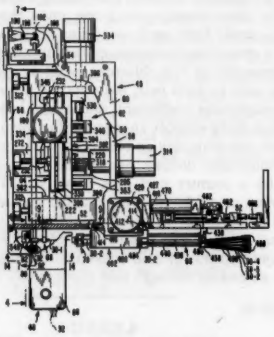
SELECTIVELY WINDING STRANDS ON A SUPPORT MEMBER

Donald W. Parham, Jr., Jamestown, and John G. Tucker, Lexington, both of N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 15, 1979, Ser. No. 85,099

Int. Cl.³ B21C 47/10

U.S. Cl. 242—7.11 26 Claims



1. Apparatus for selectively winding strands on a support member, which comprises:

a guide for each of the strands in which the strand is disposed during a winding operation;

moving means for moving each of the strand guides when the strand guide is mounted on the moving means, to locate the strand guide and the strand in the strand guide in a winding position;

means for rotating the support member to pull the strand in each of the strand guides which is located in the winding position through the strand guide, and to wind the strand on the support member;

storage means for storing the strand guides when the strand guides are not mounted on the strand guide moving means; and

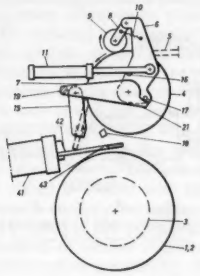
transfer means for selectively transferring the strand guides from the storage means to the strand guide moving means for a winding operation, and back to the storage means upon the completion of a winding operation.

4,320,877

COIL TYING MACHINE

Karl-Erik Svensson, deceased, late of Hagersten, Sweden; by Henny A. V. Svensson, heiress, Hagersten; by Karl J. Svensson, heir, Alvsjo, and Hans T. Svensson, heir, Hagersten, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 23, 1979, Ser. No. 25,947
Claims priority, application Sweden, Apr. 3, 1978, 7803693
Int. Cl.[3] B21C *47/00, 47/02*
U.S. Cl. 242—81 1 Claim



1. In a coil winding machine for winding a cablelike elongated member, the machine having a single rotatable capstan with a core and two sidewalls, means for moving the core along the axis of rotation of the capstan so that an end of the elongated member can be controllably pinched between the core and one sidewall when the core is in one position and so that when the core is in another position there is sufficient clearance for removal of a formed coil, the machine also having a grooved cable layering wheel oscillatingly movable in a direction parallel to the direction of the axis of rotation of the capstan whereby a coil of even layers of the elongated member can be built on the core, the improvement comprising a driving arm rotatable about the axis of the cable layering wheel, a driving wheel, means for connecting said driving wheel to the free end of said driving arm in abutting relationship with the periphery of the cable layering wheel whereby the elongated member is pressed therebetween, driving means for oscillatingly driving said driving arm between a first position whereby a portion of the elongated member is urged toward the core through the rolling action of said driving wheel and a second position whereby said portion of the elongated member is retracted, an inserting arm rotatable about the axis of the cable layering wheel, a cable guide rotatably connected to the free end of said inserting arm, and means on said driving arm for engaging said inserting arm to reciprocatingly drive the latter so when said driving arm is in said first position said guide means positions the end of the elongated member in position to be pinched between the core and the one sidewall.

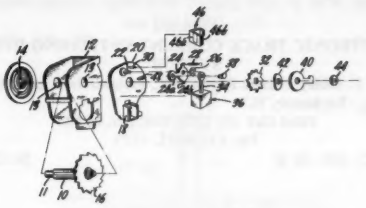
4,320,878

VEHICLE OCCUPANT RESTRAINT BELT RETRACTOR

Juichiro Takada, 3-12-1, Shinmachi Setagayaku, Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 132,167
Claims priority, application Japan, Mar. 24, 1979, 54-033831
Int. Cl.[3] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.6 2 Claims

1. In a vehicle occupant restraint belt retractor having a rotatable belt reel that is journalled on a frame and is normally urged to rotate in the belt-winding direction by a winding spring, the improvement of a system for selectively locking the reel against rotation in the belt-winding direction comprising a ratchet wheel affixed to the reel shaft and having ratchet teeth facing in the belt-winding direction; a pawl mounted on the frame for movement between a release position clear of the ratchet wheel and a lock position in engagement with a ratchet tooth for preventing rotation of the reel in the belt-winding direction; a retractor switch mounted on the frame; a retractor switch control lever rotatably mounted on the reel shaft and selectively engageable with the switch to transfer it to one position when the reel is rotated in the belt-unwinding direction and to release it to the other position when the reel rotates in the belt-winding direction and engageable with a stop on the frame when the reel is rotated in th belt-winding direction; clutch means interposed between the lever and the shaft for



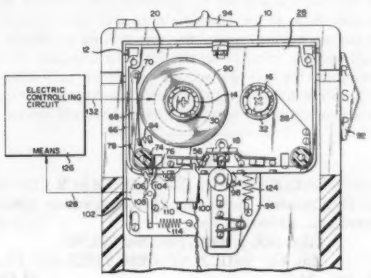
transmitting rotary motion from the shaft to the lever while permitting rotation of the shaft relative to the lever; electrical actuating means for shifting the pawl into engagement with the ratchet wheel, and control means for controlling the actuating means including timer means for delaying locking engagement of the pawl with the ratchet for a predetermined time after a full transfer and release cycle of the retractor switch by the control lever in response to belt-unwinding followed by belt-rewinding rotation of the reel.

4,320,879

TAPE CASSETTE DRIVE ASSEMBLY

Sinichi Saitou; Toshikazu Kato; Seizo Watanabe, all of Hachioji; Toyoo Nishiyama, Musashimurayama; Misao Shimoda, Hamura; Tutomu Shibata, Hachioji; Kenji Kimura, Tachikawa, and Ken Satoh, Akikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,449
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—189 8 Claims



1. A device for stably running a magnetic recording tape of a tape cassette which comprises a housing and a magnetic recording tape housed within the housing, the device comprising:

means for running the magnetic recording tape while providing back tension exerted on the magnetic recording tape;

a moving mechanism provided within the housing of the tape cassette with the magnetic recording tape, said moving mechanism being moved in accordance with a magnitude of the back tension exerted on the magnetic recording tape;

a detection mechanism for detecting an amount of movement of the moving mechanism; and

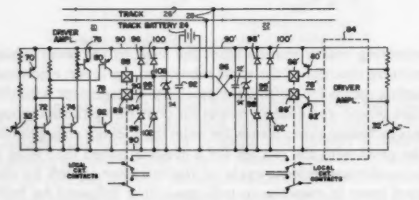
an adjusting means connected to the detection mechanism and to the magnetic recording tape running means, said adjusting means including means for adjusting the magnitude of the back tension exerted on the magnetic recording tape in accordance with the amount of movement of the moving means detected by the detection mechanism so as to maintain constant the magnitude of the back tension.

4,320,880

ELECTRONIC TRACK CURRENT SWITCHING RELAY SYSTEM

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corp., Rochester, N.Y.

Filed Oct. 17, 1979, Ser. No. 85,838
Int. Cl.³ B61L *3/10*
U.S. Cl. 246—34 R **14 Claims**



1. A signaling system comprising first and second signaling circuits having first and second unidirectionally conductive signaling devices which are conductive in a forward direction, first and second input terminals for operating current for said first and second circuits, first means for connecting said first and second signaling devices to said first terminal in a first sense, second means for connecting said first and second signaling devices to said second terminal in a second sense, said first and second senses being opposite senses, said first circuit having means for establishing a current path from said first terminal in the forward direction to said first device and said first circuit activating said first device while applying a reverse bias to said second device to interlock said second device against activation at the same time as said first device, said second circuit having means for establishing a circuit path from said second terminal in the forward direction through said second device and said second circuit for activating said second device while applying a reverse bias to said first device against activation at the same time as said second device.

4,320,881

FAIL-SAFE DECODER FOR DIGITAL TRACK CIRCUITS

Richard D. Campbell, Swissvale, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Oct. 3, 1980, Ser. No. 193,765
Int. Cl.³ B61L *21/00*; G08C *19/28*
U.S. Cl. 246—34 B **13 Claims**

1. Track circuit apparatus for a section of railroad track, comprising,

(a) transmitter means coupled to the rails at one end of said section for continuously transmitting through said rails a preselected unique sequential digital track code of selected length to detect the occupancy condition of and to identify said section,

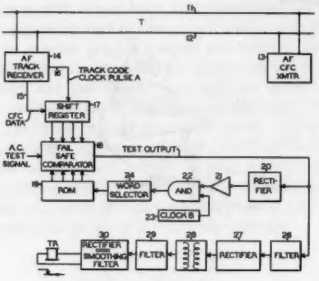
(b) register means coupled to said rails at the other end of said section for sequentially registering the digital code received when the section is unoccupied by a train and continuously producing a parallel output of the existing registered code pattern,

(c) memory means operable for supplying in parallel format a digital code output selected from a plurality of stored digital codes, one for each possible different pattern of said unique track code,

(d) comparator means coupled to said register means and said memory means for comparing the parallel output code patterns,

(e) a test signal source coupled for supplying a test signal input of predetermined characteristics to said comparator means,

(f) said comparator means responsive only to equivalent



input code patterns from said register means and memory means for producing a test signal output,

(g) selector means coupled to said memory means and controlled by said comparator means for selecting in a predetermined sequence the stored code pattern output by said memory means when an output test signal is not produced, and

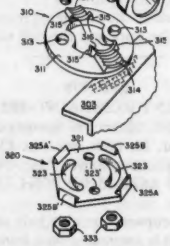
(h) output means coupled to said comparator means and responsive only to periodic output test signals for registering an unoccupied track section indication.

4,320,882

CLAMP FOR GROUNDING AND CLAMPING A CONDUIT TO A SUPPORT MEMBER

Walter W. Bachle, Harwinton, Conn., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 891,239, Mar. 29, 1978. This application Dec. 31, 1979, Ser. No. 108,860
Int. Cl.³ F16L *3/24*; H01R *4/46*
U.S. Cl. 248—70 **9 Claims**



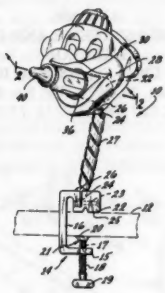
1. A conduit and ground clamping device for grounding and clamping a conduit to a structural member and comprising in combination:

(a) a pad member;

(b) a jaw member; and

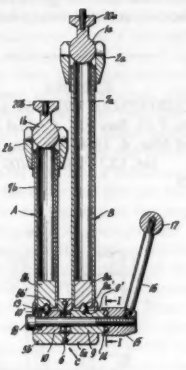
(c) a clamp member; wherein
(d) said pad member comprises a solid conducting member, albeit possibly including some perforations for expeditous assembly with said jaw and clamp members, and proportioned so that the cross sectional area of the conducting portion of said pad and which is included in a plane between opposed obverse and reverse sides is an order of magnitude greater than the minimum cross sectional area of the conducting portion of said pad included in a second plane perpendicular to said first plane;
(e) said obverse and reverse sides of said pad having a substantial portion of the surface area thereof configured to make electrical contact with a conduit and a first side of a structural member, respectively, when placed in contact therewith for reducing the electrical contact resistance between said conduit and said pad and between said pad and said structural member;
(f) said jaw member having obverse and reverse sides with said obverse side of said jaw including first and second clamping edges for engagement with a second side of the structural member, opposite said first side, and for contacting the reverse side of said pad, respectively, when said jaw is placed in contact with said second side and when pressure is applied therebetween and wherein said jaw may be coupled to said pad by said clamp member at selected positions of relative rotation between said jaw and said pad by including a plurality of holes for allowing said relative rotation;
(g) said clamp member serving to couple said pad member and said jaw for applying pressure between the enumerated members when the conduit and ground clamping device is assembled in combination with a conduit and structural member; whereby
(h) the electrical resistance between a conduit and a structural member is minimized.

4,320,883
POSITIONABLE TOY/BOTTLE HOLDER
Wayne E. Bass, 8839 Keremeos Way, San Diego, Calif. 92126
Filed Jun. 23, 1980, Ser. No. 162,004
Int. Cl.³ A47D *15/00*
U.S. Cl. 248—104 **16 Claims**



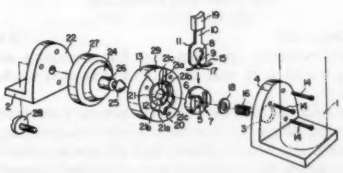
1. A positionable support for a baby bottle, selected from a plurality of baby bottles having a range of different diameters comprising:
a bottle holding member with a bottle insertable opening therethrough, a groove formed within said opening, a removable resilient ring member inserted into and held by said groove, said resilient ring member extending into said opening whereby a baby bottle inserted through said ring member is held thereby;
an extension member pivotly attached at one end to said bottle holding member; and
a base member pivotly attached to the other end of said extension member, said base member includes clamp means for clamping said base member to a support surface; the resiliency of said resilient ring member provides substantial resistance to any movement of said baby bottle inserted therein.

4,320,884
TRIPOD ARM
Bengt Leo, Gärdesvägen 1, S-730 40 Kolbäck, Sweden
Filed Mar. 5, 1980, Ser. No. 127,314
Claims priority, application Sweden, Mar. 5, 1979, 7901941
Int. Cl.³ E04G *3/00*
U.S. Cl. 248—276 **9 Claims**



1. A device for adjustably mounting an article on a tripod comprising:
first and second arms connected by an interposed joint member, said joint member having two halves pivotally arranged adjacent one another on a common axle, one end of each of the first and second arms being attached to and extending from each of said halves, respectively;
connecting means at the unattached ends of each of the arms for adjustably connecting each of the arms to an article and a tripod, respectively;
means for pivotally positioning said joint halves and the attached arms about the axle and means for locking each of the connecting means and the joint halves in a fixed position.

4,320,885
COUPLING DEVICE
Michio Kawazoe, 30-11, 5-chome, Higashi, Narita Suginami ku, Tokyo, Japan
Continuation of Ser. No. 38,890, May 14, 1979. This application Feb. 27, 1981, Ser. No. 238,808
Claims priority, application Japan, Jan. 22, 1979, 54-007062[U]
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—222.1 **7 Claims**



1. A coupling device for connecting devices such as a strobo, camera, a tripod etc. comprising first holder being provided on

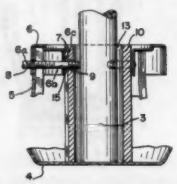
one of said device to be connected, second holder having a center hole being fixed to said first holder, a clamp member having a center hole being inserted rotatably between said first holder and second holder, a locking member having a large hole for inserting and recess for locking being inserted slidably into said clamp member, a spring for urging said clamp member against second holder, a cam means provided at the opposing faces of said second holder and clamp member, a holder being provided on the other of said devices to be connected, the holder engages with said second holder by friction, and a stud provided on the holder to be inserted into said center holes and a large hole having a head engaged with said recess of the lock member, characterized in that the lock member gives engaging or releasing action with said stud by sliding movement and the lock member gives fastening or loosening action through the cam action between said second holder and clamp member.

4,320,886

CHRISTMAS TREE SPACER

George J. Stodola, P.O. Box 734, Crystal River, Fla. 32629

Filed Mar. 6, 1980, Ser. No. 127,537
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—523 2 Claims



1. A spacer for use with the erection and support of a Christmas tree comprising

a hollow body having a central opening of a diameter substantially corresponding to the diameter of the tree shaft,

said hollow body including a plurality of openings adapted to be aligned with the threaded shafts of a Christmas tree stand for insertion therethrough,

said hollow body having a flat bottom surface to bear against a portion of the Christmas tree stand,

said openings being located at a position from a lower end of said body equal to the position of the threaded shafts on the stand supporting a Christmas tree,

said body providing lateral stability and instantaneous alignment of the tree during attachment to the tree stand, and

said openings are positioned in longitudinal external slots formed parallel to the longitudinal axis of said body.

4,320,887

TOOL SUPPORT FOR CONCRETE PILINGS

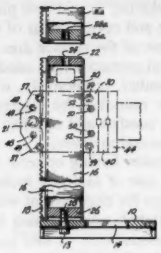
Allen L. Destree, 5218 92nd SW., Everett, Wash. 98204

Continuation-in-part of Ser. No. 952,916, Oct. 19, 1978. This application May 19, 1980, Ser. No. 150,734
The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—651 9 Claims

1. A tool mounting apparatus used for positioning and manipulating a tool at or near the end of elongated workpieces comprising:

an elongated rectangular column having a toothed rack extending along one side thereof; said column comprising at least one column segment, each column segment having a protruding block fastened into a first end thereof and a recessed block fastened into the second end thereof; said protruding block adapted for insertion into said second end of another column segment end adjacent thereto; said protruding block and said recessed block having apertures therein allowing a threaded fastener to axially retain two adjacent segments in peripheral contact without face-to-face contact of said protruding block and said recessed block;

support means for encircling and tightening said column to said workpiece in a substantially parallel orientation to said workpiece;



a support collar, mounted at right angle to said column for bearing the weight of said tool mounting apparatus upon the end of said workpiece;

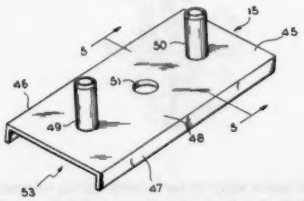
carriage means slidably mounted on said column, said carriage means having a pinion means engaging said toothed rack whereby rotation of said pinion means moves said carriage means along said column thereby providing movable support for a tool mounted thereon.

4,320,888

CONCRETE FORM SYSTEMS AND COMPONENTS THEREOF

Ralph M. Oury, 123 Chase St., Wheaton, Ill. 60187

Filed Jun. 20, 1979, Ser. No. 50,187
Int. Cl.³ E04G *17/12, 17/02*
U.S. Cl. 249—45 4 Claims

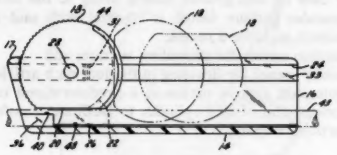


1. A rectangular plate adapted to tie together side-by-side, edge abutting panels used as wall members in a concrete form system, said plate having a center hole and two studs projecting from the inner face thereof on opposite sides of said hole and at substantially equal distances from said hole, said hole and the opposite, longitudinal edges of said plate being bent less than 90° in the direction away from said inner face to provide longitudinal, transverseley diagonal flange edges on opposite longitudinal sides of said plate.

4,320,889
FLOW CONTROL DEVICE WITH ROLLER ORIENTATION MEANS

Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 16, 1980, Ser. No. 150,503
Int. Cl.³ F16K 7/06
U.S. Cl. 251—6 8 Claims



1. A flow control device for regulating flow through a length of flexible tubing comprising:

a clamp body having a longitudinal axis and defining a surface for supporting a length of flexible tubing;

opposing walls extending from said surface and presenting a passage for said tubing;

guide surfaces arranged in said walls;

a rotatable member guided, rotated and moveable longitudinally along said guide surfaces;

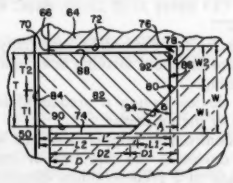
a groove of progressively varying depth extending peripherally around a portion of said rotatable member;

orientation means defined as a portion of said rotatable member and said clamp body to position said rotatable member in said clamp body and between said opposing walls so that said groove will be held in immediate contact with said tubing to press said tubing against said support surface upon rotation of said rotatable member wherein said rotatable member is defined by a roller member and said orientation means is defined by an interfering member extending from said supporting surface and a complementary section formed as a portion of said rotatable member so that said complementary section of said roller member will pass over said interfering member and will permit rotation of said roller member after passage thereover; and wherein said interfering member is defined by at least one block member adjacent one of said opposing walls and said complementary section is defined by a flat segment provided in said roller member adjacent said groove.

4,320,890
VALVE SEAT STRUCTURE

Danny S. Meyer, Richmond, and William S. Shelton, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,391
Int. Cl.³ F16K 3/00
U.S. Cl. 251—328 12 Claims



1. In an expanding gate valve structure having a valve body with a valve chamber therein, inlet and outlet flow passages communicating with the valve chamber and an annular recess about each flow passage, and a gate assembly including a gate element and segment slidably mounted within the valve chamber for movement between open and closed positions with said gate element and segment expanding away from each other at the open and closed positions, an improved valve seat structure mounted within each annular recess, said improved valve seat structure comprising:

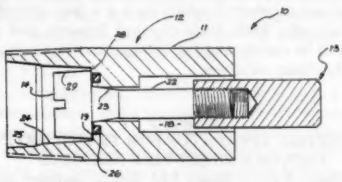
an annular seat element having a front seat face and mounted in the annular recess with the front seat face disposed adjacent the gate assembly, said front seat face having an annular groove therein with said annular groove defining an inner groove side nearest the flow passage and an outer groove side further from the flow passage and a bottom joining said inner and outer groove sides, said bottom having a flat bottom portion extending generally perpendicularly from said inner groove side and a frusto-conical portion facing said inner groove side and joining said flat bottom portion and said outer groove side at an inclined angle to thereby form a wedging surface; and

an annular face seal loosely received within said annular groove and having front and rear seal faces joined by generally parallel inner and outer cylindrical seal sides, said rear seal face having a flat rear surface portion adjoining said inner seal side and a frusto-conical rear surface portion joining the outer seal side and said flat rear surface portion at angles conforming to the respective angles of inclination of the frusto-conical bottom portion with the outer groove side and flat bottom portion of the groove, said annular face seal having a length dimension between said front and rear seal faces which exceeds the depth of said annular groove such that the front seal face extends beyond the front seat face into the valve chamber when said annular face seal is loosely seated in the groove with their frusto-conical surfaces in contact and the gate assembly in a collapsed condition with fluid pressures on both sides of the face seal being equal whereby the expansion of the gate assembly when in its open and closed positions effects an axial compression circumferentially about each annular face seal on both the upstream and downstream sides of the gate assembly and further, when in the closed position, the annular face seal on the upstream side is urged against the wedging frusto-conical groove bottom towards the gate assembly by fluid pressure in said flow passage to effect a tight seal thereagainst which increases with increasing fluid pressure in the flow passage.

4,320,891
NIPPLE OPERATED ANIMAL WATERING VALVE

Gerald J. W. Cairns, Wyee, Australia, assignor to Howard Ingram Cairns, Wyee, Australia, a part interest

Filed Apr. 21, 1980, Ser. No. 142,301
Int. Cl.³ F16K 1/00
U.S. Cl. 251—332 4 Claims



1. A nipple operated animal watering valve comprising a body, a passage extending through the body which is adapted at one end to be attached to a supply of water under pressure, said passage having a valve seat intermediate the ends of the passage, a movable valve member to co-operate with the seat and biased to close the passage under the influence of the water pressure, a nipple attached to said member and projecting outwardly from said passage via the other end to enable manip-

ulation of the nipple to move said valve from a seated position to allow liquid to pass through the valve and wherein said passagehas a fruston-conical portion which converges in the direction of normal flow through the valve and toward said seat, and said valve member has a frusto-conical side wall portion co-extensive with the passage portion, which side wall portion diverges toward said seat and co-operates with the passage portion to clear the valve of particle matter which may enter the valve.

4,320,892

KNIFE SHARPENER

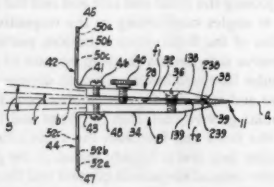
Howard R. Longbrake, 16740 Indian Hollow Rd., Grafton, Ohio 44044

Continuation-in-part of Ser. No. 78,441, Sep. 24, 1979, abandoned, which is a continuation of Ser. No. 899,109, Apr. 24, 1978, abandoned. This application Dec. 29, 1980, Ser. No. 220,899

The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.

Int. Cl.³ B24B *3/54;* **B21K** *5/12;* **B25B** *3/00*

U.S. Cl. 269—3 **2 Claims**



1. A portable work holder for positioning and maintaining an article to be sharpened, such as, a knife, in predetermined relative position to a sharpening member or tool for the purpose of sharpening the same with a predetermined like bevel on both sides of its cutting edge comprising two duplicate clamp members including duplicate relatively long narrow members having opposed planar clamping surfaces adjacent to one of their ends and the opposite sides of said ends beveled endwise, means adjacent to but spaced from said one ends of said members pivotally connecting said members together, means between said first mentioned means and other ends of said members opposite to said one ends thereof for moving said one ends of said members toward one another, each of said members having a part provided wih at least one aperture extending generally normal to said planar surface of the member of which it is a part and in the direction away from the other member, said at least one aperture in said parts of said members each being located at a like fixed distance from said planar surface of said member of which each is a part whereby the center plane of a knife blade clamped between said planar surfaces will be exactly midway between corresponding apertures of the clamp members.

4,320,893

TRANSPORT APPARATUS FOR TRANSPORTING FLEXIBLE SHEET-LIKE ARTICLES

Martin Blümle, Weil am Rhein, Fed. Rep. of Germany, assignor to Winkler & Dünnebier and Maschinenfabrik & Eisengieserei GmbH & Co., both of Neuwied, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,844

Claims priority, application Switzerland, Jun. 23, 1979, 5847/79

Int. Cl.³ B65H *3/12*

U.S. Cl. 271—94 **6 Claims**

1. Transport apparatus for transporting flexible sheetlike articles, comprising:

a frame;

a transport cylinder which is mounted on said frame to be rotatable about an axis and which includes

means for defining at least two suction transfer ducts,

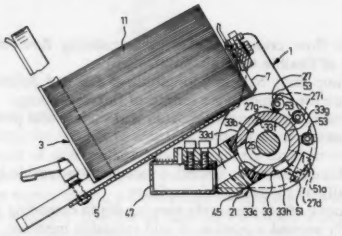
passage means, connected to said ducts and opening at the circumference of said cylinder, for supplying suction to attract individual such articles to said circumference for transport by said cylinder, and

a groove means for extending circumferentially of said cylinder and between said ducts,

the base of said groove means being in the form of an annular surface which is co-axial with said axis and which includes a recess;

a suction means for providing suction; and

transfer means for drawing individual such articles partly into said groove means in a predetermined rotational orientation of said cylinder to facilitate transfer of the articles thereto,



said transfer means including a member which is mounted on said frame to be secure against rotation and which projects into said groove means,

said member including an inner surface facing said annular surface and extending concentrically therewith and further including means for defining a first passage connected to said suction means and opening at said inner surface of said member and a second passage which extends between and opens at said inner surface of said member and an outer surface of said member in said groove means and which second passage is connected to said first passage by said recess when the cylinder is in said predetermined rotational orientation for supplying suction to attract said individual articles to said outer surface.

4,320,894

APPARATUS FOR OUTFEEDING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING IN AN IMBRICATED ARRAY

Walter Reist, Hinwil, and Werner Honegger, Tann-Rüti, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed Jun. 25, 1979, Ser. No. 51,344

Claims priority, application Switzerland, Jun. 30, 1978, 7134/78

Int. Cl.³ B65H *5/12, 29/04;* **B65G** *47/86*

U.S. Cl. 271—277 **32 Claims**

1. An apparatus for outfeeding essentially flat products, especially printed products, arriving in an imbricated product stream, comprising:

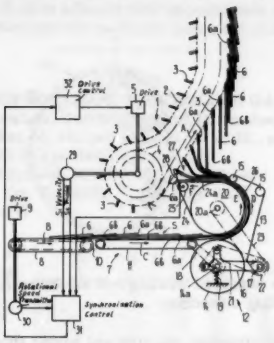
a conveyor device having a predetermined direction of conveying of the products;

individually controllable grippers arranged in tandem at said conveyor device in the direction of conveying of the products and at a predetermined distance from one another;

said individually controllable grippers serving for engaging the infed products at their leading edge;

means for infeeding the products to said conveyor device in an imbricated product formation where each product bears upon the next following product; and

said predetermined direction of conveying, at least at a transfer region of the products from said infeeding means to said conveyor device, being directed from the underside of the product to be engaged by the gripper towards the upper side of said product and extending essentially



transversely with respect to a plane defined by the product to be engaged in order to lift the topmost product from the imbricated product formation in a manner so as not to essentially disrupt the remainder of the imbricated product formation.

4,320,895

RUNNING TRAINING APPARATUS

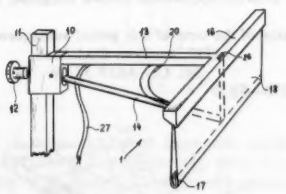
Simon Müller, Stationsstrasse, CH 8442 Hettlingen, Switzerland

Filed May 16, 1980, Ser. No. 150,358

Claims priority, application Switzerland, May 18, 1979, 4656/79

Int. Cl.³ A63B *23/04*

U.S. Cl. 272—70 **8 Claims**



1. A training apparatus for monitoring the performance of a runner, said apparatus comprising:

a mechanical sensing means engageable with legs of a runner and including an element movable by the leg movements of the runner;

means for converting movement of said element into a signal; and

electronic evaluation means responsive to said signal for recording same, said mechanical sensing means comprising:

an upright post,

a support shiftable along said post and provided with means for locking said support to said post at a selected height therealong,

an upper first arm fixed to said support and projecting substantially horizontally therefrom, said upper arm having a free end spaced from said support,

a lower second arm pivotally connected to said support, coplanar with said first arm and extending from said support codirectionally with said first arm, said lower arm being T-shaped and formed at a free end therof remote from said support with a horizontal cross member forming said element, and

spring means interconnecting said arms proximal to the free ends thereof for resisting upward displacement of said lower arm upon engagement of the legs of the runner with said cross member.

4,320,896

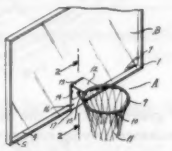
SHOCK-ABSORBING ASSEMBLY FOR BASKETBALL BACKBOARD

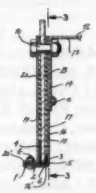
Charles J. Engle, and Robert A. Boitano, both of St. Louis, Mo., assignors to Gared Corporation, St. Louis, Mo.

Filed Oct. 1, 1980, Ser. No. 192,682

Int. Cl.³ A63B *63/08*

U.S. Cl. 273—1.5 R **10 Claims**





1. A basketball goal-backboard unit comprising in combination a planar backboard constructed of glass, a rigid frame engaging the edge portion of said backboard throughout its peripheral extent, a shock absorbing assembly comprising a front plate and a back plate disposed in registering relationship forwardly and rearwardly, respectively, of said backboard, means securing said front and back plates upon said frame, resilient means sandwiched snugly between said front and back plates and said backboard for absorbing shock, a basketball goal, means engaging said goal upon the backboard-remote face of said front plate, and means interconnecting said means engaging said goal and said shock absorbing assembly.

4,320,897

BOWLING-BALL RETURN DEVICE

Wallice E. Fields, 405 Heritage, Eugene, Oreg. 97404

Continuation of Ser. No. 17,369, Mar. 5, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 193,938

Int. Cl.³ A63D *5/02*

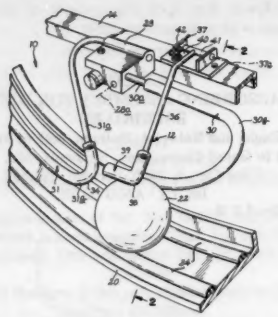
U.S. Cl. 273—49 **1 Claim**

1. In a bowling-ball return apparatus having a circular, rotatable conveyor and a frictional guide member cooperative therewith to capture a bowling ball for upward return delivery along a defined path when the ball arrives at a capture station defined by the conveyor and guide member along said path, a device for enhancing such capture comprising

an arm pivotally mounted on said apparatus for swinging relative thereto, said arm having a free end movable toward and away from a predetermined position adjacent and upstream from said station, under the influence of gravity, and

frictioning means mounted on said free end, including an elongated reach extending generally parallel to an elongated segment of said path which terminates, in a downstream direction, at said capture station, said reach being

engageable with a ball as the same travels on the conveyor along such path segment, through movement of said free end away from said predetermined position, against the



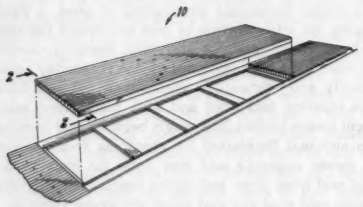
force of gravity, to bias the ball toward said conveyor, thus to enhance driving engagement between the ball and the conveyor along such path segment.

4,320,898

COMPOSITE PANEL MEMBER FOR USE IN A BOWLING LANE

George E. Brunst, Coshocton; Francis E. Thomas, West Lafayette, and Walter W. Wanner, Coshocton, all of Ohio, assignors to General Electric Company, Coshocton, Ohio

Filed Jul. 9, 1979, Ser. No. 56,272
Int. Cl.³ A63D *1/00*
U.S. Cl. 273—51 **16 Claims**



1. A composite panel member for use in a bowling lane comprising:

a wood core member, said wood core member including a plurality of strip portions which are firmly connected to one another, each of said wood strip portions having an equilibrated moisture content which is within 2% of every other wood strip portion, said wood core member including a pair of opposed faces and a plurality of edge portions;

a pair of high pressure laminate members, each of said laminate members being firmly adhered to one of the faces of said wood core member, each of said laminate members being substantially the same in length, width and thickness, at least one of said laminate members including a resin impregnated core, a print sheet disposed on said resin impregnated core, said print sheet including customary bowling lane indicia, and a resin impregnated overlay disposed on said print sheet; and

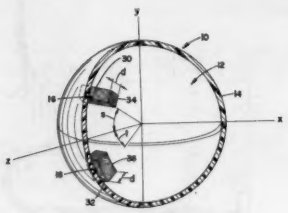
a moisture proof coating disposed on said plurality of wood core member edges such that said core member is completely sealed.

4,320,899

BOWLING BALL

Carmen M. Salvino, 2658 N. New England, Chicago, Ill. 60635

Filed Feb. 25, 1980, Ser. No. 124,393
Int. Cl.³ A63B *37/10*
U.S. Cl. 273—63 E **31 Claims**



22. An improved bowling ball exhibiting dynamic stability after drilling comprising:

a core;

a cover surrounding said core and having an outer surface;

weight block means disposed within said ball inward of said outer surface of said cover, said weight block means being positioned so as to be intersected by grip holes when drilled into said ball there being no concentrated residual weight provided by said weight block means after drilling;

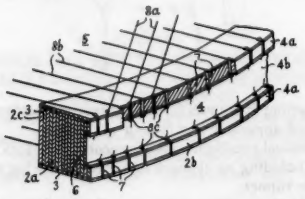
the density of said core, the density of said cover and the shape and density of said weight block means being such that after drilling all axes of said ball may be a spin axis in which the products of inertia for all axes perpendicular to the spin axis are small thereby producing a stable trajectory for the ball as it slides and rolls down a lane.

4,320,900

RACKETS

Robin M. Blackburne, Ardsheal Cottage, Paget 6-20, Bermuda

Filed Feb. 12, 1980, Ser. No. 120,742
Claims priority, application United Kingdom, Feb. 20, 1979, 5976/79
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.³ A63B *51/06*
U.S. Cl. 273—73 D **23 Claims**



1. A games racket comprising a handle intended to be held in the hand, and carrying a head having a frame defining a central opening, across which extends tensioned stringing carried by the head, the stringing being composed of two sets of stringing with each set being disposed in a respective one of two spaced generally parallel planes, and comprising first and second groups of generally parallel string portions, with the string portions of the first group being interwoven with, and generally perpendicular to, the string portions of the second group, the frame having opposite side surfaces which are spaced apart in a direction generally normal to the planes of the stringing, with the strining passing through apertures distributed around the frame and opening into said opposite side surfaces, the frame being provided in its outer periphery with a channel extending around the central opening and defining flanges with

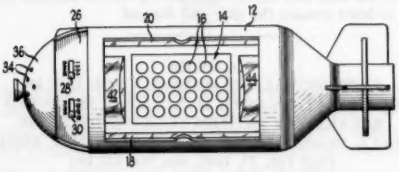
said opposite side surfaces, with the stringing-receiving apertures opening into the channel, wherein at least some of the stringing-receiving apertures comprises slots in said flanges which open into the outer periphery of the frame, and wherein at least some of the string portions comprise discrete lengths of stringing which, at or adjacent their opposite ends, are located in associated slots and are anchored within the channel.

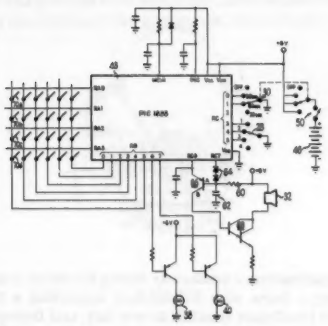
4,320,901

MICROPROCESSOR CONTROLLED GAME

Howard J. Morrison, Deerfield; Jeffrey D. Breslow, Highland Park, and Rex M. Harper, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1980, Ser. No. 119,749
Int. Cl.³ A63B 71/04; A63F 9/00
U.S. Cl. 273—237 **30 Claims**





14. In an electronic keyboard game, the combination of, means for establishing a predetermined time period during which a game is to be played, means for generating light flashes the frequency of occurrence of which increases during said time period, a plurality of keys arranged in a keyboard of predetermined configuration for actuation by a player one at a time, means for storing representations corresponding to each of said keys as they are actuated by a player, and means responsive to a second actuation of one of said keys by a player prior to the expiration of said time period for generating a sensorially perceptible event including a continuous light in place of said flashes.

4,320,902

PITCHING TRACK GAME

Arthur G. Florkey, 3925 Heatherwood West, Traverse City, Mich. 49684

Filed Feb. 23, 1981, Ser. No. 237,369
Int. Cl.³ A63F 7/20, 7/02
U.S. Cl. 273—352 **1 Claim**

1. A game board having elevated sides to retain a ball wherein the invention comprises:

a. an elevated cross-bar extending across said game board;

b. a pitching track balanced and rotatably mounted on said cross-bar;

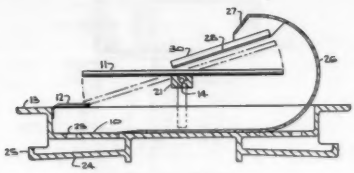
c. a biasing mechanism on said cross-bar causing said pitching track to assume a horizontal posture;

d. a horizontal receiving track, on opposing sides of said game board, upon which said pitching track rests when tilted;

e. a batter's loft extending distally from said receiving track;

f. means for striking a ball on said batter's loft;

g. a curvilinear ramp coterminus with said game board on its lower portion and then curling upwards in an arc extending generally radially from said pitching track when tilting;



h. a ramp lip angled downward on the upper portion of said curvilinear ramp;

i. a delivery channel suspended beneath the ramp lip which inclines downward toward the point where said pitching track is balanced upon said cross-bar; and

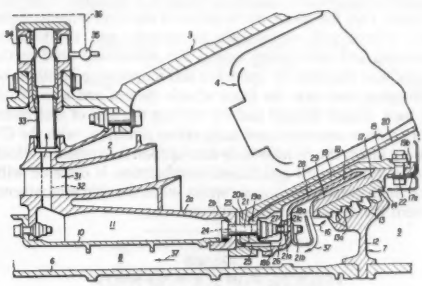
j. two side beams forming a "V", along the sides of the said delivery channel which tend to route a ball near the point where said pitching track is balanced upon said cross-bar.

4,320,903

LABYRINTH SEALS

Michel R. Ayache, Epinay sous Senart; Pierre A. Glowacki, Melun, and Gerard M. F. Mandet, Epinay sous Senart, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sep. 27, 1979, Ser. No. 79,433
Claims priority, application France, Sep. 27, 1978, 78 28166
Int. Cl.³ F01D 5/08; F16J 15/44
U.S. Cl. 277—22 **8 Claims**

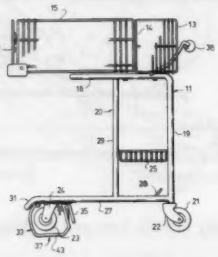


1. A cooling device for a labyrinth seal mounted on a shaft connecting an air compressor to a gas turbine in order to separate the air space, or upstream space, from the gas space, or downstream space, said seal comprising fins carried by said shaft and rapidly rotatable with respect to a static wear surface mounted on a support, comprising means defining an annular canal surrounding said support of the wear surface of the seal, said canal having the same form of revolution as the envelope of the fins of said seal and being connected by its downstream extremity to an air intake provided in the wall of the casing of a combustion chamber of said turbine, with its other extremity open upstream of the seal into a lower-pressure air space which surrounds said shaft of said compressor.

4,320,904
SKID ATTACHMENT FOR SHOPPING CARTS

Donald N. Walters, 7655 Arnold Dr., North Tonawanda, N.Y. 14120, and Theodore P. Link, Coleman Rd., Marilla, N.Y. 14102

Filed Jan. 7, 1980, Ser. No. 109,833
Int. Cl.³ B60F 5/00
U.S. Cl. 280—7.12 10 Claims



1. A shopping cart incorporating a removable skid attachment, to facilitate use of such cart in snow, which comprises a nestable supermarket shopping cart, nestable with other such carts by horizontal relative motion thereof, which cart includes a pair of front wheels, each of which is rotatable about a horizontal axis which is transverse to the longitudinal axis of the shopping cart when the cart is being moved forwardly and which wheels are movable about a vertical axis, and a pair of rear wheels, each of which is rotable about a horizontal transverse axis in a vertical plane parallel to the longitudinal axis of the cart, a removable skid attachment which includes a pair of skid members, each of which is substantially C-shaped, which members are simultaneously movable into inoperative and into operative skid positions, as desired, with respect to the shopping cart, so that when the skid members are in operative position they are below the shopping cart front wheels and alongside and outside of such wheels, bearing the weight of the cart instead of the front wheels bearing such weight, with the open ends of the C's being up, and so that when the skid members are in inoperative position, which is a retracted or storage position, they are above the bottoms of the front wheels, inside such wheels and subtantially horizontal, and combination mounting and positioning means, for selectively holding the pair of skid members in operative and inoperative positions on a shopping cart near the front wheels thereof and away from the back wheels thereof and for moving the pair of skid members between operative and inoperative positions, with the C's passing under the front wheels during such movements, which shopping cart—skid attachment combination is nestable with other such combination apparatuses when the skid attachments thereof are in inoperative positions.

4,320,905
VEHICLE FOR ICE AND SNOW

Edward Andrew, 21 Valley View Rd., Verona, N.J. 07044, and Gerard Bello, 225 Walnut St., Montclair, N.J. 07042

Filed Nov. 2, 1978, Ser. No. 956,846
Int. Cl.³ B62B 13/00
U.S. Cl. 280—12 H 18 Claims

1. A vehicle for snow and ice ridden by standing comprising:

(a) a boat-like hull section having a substantially flat bottom, an upwardly curved forward end and an upwardly curved after end;

(b) a pair of outer parallel runners extending along the outer portions of said bottom;

(c) a center runner extending along the center portion of said bottom to the forward end of said hull section;

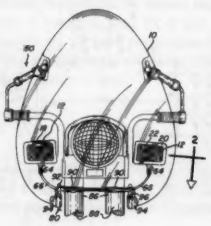
(d) a forward platform member mounted atop said hull section at the forward end thereof, said forward platform member being inclined toward the forward end of said hull section; and

(e) an after platform member mounted atop said hull section at the after end thereof; said after platform member being inclined toward the after end thereof.

4,320,906
TURN SIGNAL SUBASSEMBLY FOR USE IN COMBINATION WITH HANDLEBAR MOUNTED BREAKAWAY MOTORCYCLE WINDSCREEN

Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601

Filed Feb. 27, 1980, Ser. No. 125,181
Int. Cl.³ B62J 17/04
U.S. Cl. 280—289 S 5 Claims



1. In combination: a breakaway fairing for use on a motorcycle having a frame with a front fork supporting a steerable wheel and handlebars attached to said fork, said fairing including an upper pair of mounting brackets depending from the handlebars, a lower mounting bracket depending from the fork and a windscreen removably connected to said upper and lower mounting brackets for detachment therefrom upon the application of a forwardly-directed impact blow to the rear face thereof of a predetermined magnitude; and, a turn signal subassembly including a pair of lamp housings containing transparent lenses attached to the windscreen in transversely-spaced relation and a wiring harness mounted upon the motorcycle frame, said wiring harness having one end connectable to a source of electrical energy carried by the motorcycle and the other end provided with a pair of lamp sockets detachably connected to the lamp housings with a quick-disconnect coupling, said quick-disconnect coupling being effective to detach the wiring harness from the lamp housing upon the application of an impact blow to the windscreen of a magnitude capable of separating same from the motorcycle.

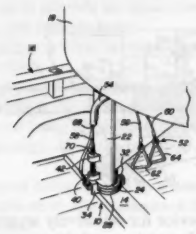
4,320,907
REMOTE CONTROL FOR NECKOVER TRAILER HITCHES

Jim N. Eaton, P.O. Box 454, Dodd St., Rodessa, La. 71069

Filed Dec. 19, 1979, Ser. No. 105,237
Int. Cl.³ B60D 1/10
U.S. Cl. 280—511 7 Claims

1. In combination with a hitch assembly, for coupling a vehicle to a trailer, having two coupling members interengage-

able at a predetermined location on the vehicle, a lock element mounted on one of said members and displaceable to a locking position preventing disengagement of the coupling members, and latch means for holding the lock element in said locking position, a pair of actuating cables respectively connected to the lock element and the latch means, grip means connected to said cables for exerting control forces on the lock element and



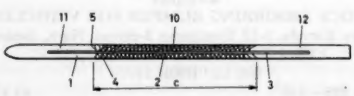
the latch means, guide means through which the cables extend for locating the grip means in remote spaced relation to said location on the vehicle, and a mounting structure depending from a forward end of the trailer to which one of the coupling members is secured, said guide means comprising a curved guide tube secured to the mounting structure and having fixed opposite end portions from which the cables extend toward the coupling members and the grip means, respectively.

4,320,908

SKIS

Olav Ellingsen, Floro, and Olav Asnes, Straumsnes, both of Norway, assignors to Åsnes Skifabrikk A/S, Straumsnes, Norway

Filed Apr. 18, 1980, Ser. No. 141,469
Claims priority, application Norway, Mar. 5, 1980, 800631
Int. Cl.³ A63C *7/06*
U.S. Cl. 280—604 **5 Claims**



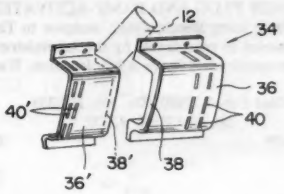
1. An improvement on a ski having a so-called waxless (no-wax) plastic sole wherein a pattern in the form of a plurality of rearwardly-directed curbs is provided in the running surface of the sole, characterized in that the pattern consists of a plurality of arc-shaped, wedge-formed first cuts wherein the center of the arcs lies to one side (b) of the longitudinal central plane of the ski, and a plurality of arc-shaped, wedge-formed second cuts which intersect said first cuts, the center of the latter arcs lying on the other side (a) of the central longitudinal plane of the ski, each of said first and second cuts project across and intersect on both sides of said longitudinal central plane.

4,320,909

OCCUPANT'S KNEE PROTECTING DEVICE

Takashi Nakamori, Yokosuka; Zensho Matsumoto, Yokohama; Kiyomi Matsushita, Yokosuka; Masayoshi Katoh, Yokohama, and Hideoki Matsuoka, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 2, 1980, Ser. No. 136,605
Claims priority, application Japan, Apr. 10, 1979, 54-47351[U]
Int. Cl.³ B60R *21/02*
U.S. Cl. 280—752 **5 Claims**



1. For use in a vehicle having a passenger compartment with an inwardly protruding rigid element, a device for protecting the knee of a vehicle occupant from injury resulting from impact with said element, said device comprising:

two separate shock absorbing members adapted to be mounted in the compartment in spaced apart relationship to define an opening therebetween aligned with said rigid element; and

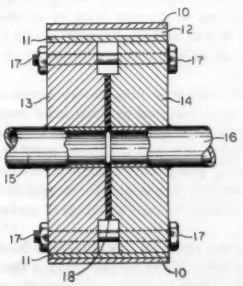
means integral with each of said shock absorbing members for varying the stiffness thereof in a manner such that the stiffness of a first section of each shock absorbing member adjacent to said opening is greater than that of a second section of each shock absorbing member laterally remote from said opening.

4,320,910

PROTECTIVE SHIELD FOR A PIPE FLANGE CONNECTION

Arthur L. Leasher, and John W. McLaren, both of Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 5, 1980, Ser. No. 156,841
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—45 **7 Claims**



1. Shield for controlling release of material through an open pipe flange connection, said connection including at least two flanges, the shield comprising:

a first flat member which defines an inner ring;

the inner ring adapted to clamp around the flange connection and completely enclose a gap defined between the flanges when the flange connection is in an open position;

a second flat member which defines an outer ring;

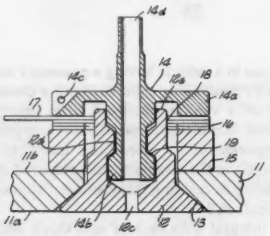
the outer ring is fabricated of an elastic material, the outer and inner rings are joined together at their ends, such that the outer ring encloses the inner ring, and the outer ring is formed to a smaller diameter than the inner ring, such that the outer ring exerts a compressive force sufficient to cause the inner ring to clamp around the flange connection.

4,320,911

HIGH TEMPERATURE PENETRATOR ASSEMBLY WITH BAYONET PLUG AND RAMP-ACTIVATED LOCK

Kenneth E. Wood, Long Beach, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 7, 1980, Ser. No. 119,335
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—89 10 Claims



1. Apparatus for effecting a penetration through a bulkhead or the like, said bulkhead being subject to high temperature environment on one surface thereof, comprising:

a bore thrc :gh said bulkhead countersunk from a first surface thereof;

a base plug having a conical shaped portion from a first end thereof inserted from said bulkhead first surface, said conical shaped substantially matching said countersunk portion of said bulkhead bore and fitted therein;

a central cavity extending through said base plug generally axially and having a centerline normal to the plane of a surface of said bulkhead, said cavity having a cross-sectional shape elongated in a plane parallel to a surface of said bulkhead;

a bayonet plug comprising an elongated generally tubular portion having a bayonet head of cross-section substantially that of said base plug central cavity cross-section but affording an axial fit into said cavity in a first angular orientation;

means within said base plug cavity comprising an internal shoulder such that said bayonet head engages said shoulder in a second angular orientation of said bayonet plug;

a flange portion integral with said tubular portion of said bayonet plug and axially spaced therefrom;

a spacing washer substantially concentric with said base plug and placed against the second surface of said bulkhead; and

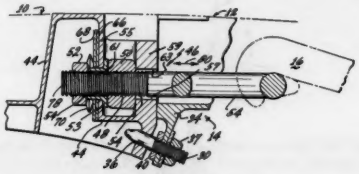
first and second ramping washers each having at least one arcuate inclined plane on one surface thereof, said ramping washers being placed substantially concentric with said bayonet plug tubular portion, between said spacing washer and said flange portion of said bayonet plug with said arcuate inclined planes facing each other, the axial dimensions with said apparatus being such that, when said bayonet plug is in place within said base plug cavity in said second angular orientation, relative rotation of said ramping washers produces axial locking of said bayonet plug in place.

4,320,912

COWL DOOR LATCH ADJUSTMENT FITTING ASSEMBLY

Thad N. Grace, Chula Vista; Carroll W. Folmer, San Diego, and Douglas W. Logan, Spring Valley, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sep. 10, 1979, Ser. No. 73,706
Int. Cl.³ E05C *21/00*
U.S. Cl. 292—341.18 2 Claims



1. A fastening device for releasively securing together the respective sides of first and second abutting aircraft structures, said fastening device being precisely adjustable while the structures are abutted together, comprising;

a base plate rigidly attached to said first abutting aircraft structure, said base plate supporting a latch eye bolt, said latch eye bolt being adjustable from the exterior of said first abutting aircraft structure;

a pivotable tension latch member attached to said second abutting aircraft structure for tension engagement with the eye of said latch eye bolt, when said first and second abutting aircraft structures are abutted in position and the eye of said latch eye bolt is properly positioned;

means for adjusting said latch eye bolt longitudinally, while said abutting structures are mated, said adjusting means including an adjusting nut threaded on the latch eye bolt and accessible, from the exterior of the aircraft structure through an aperture provided in said first abutting aircraft structure, to an open ended torque indicatable wrench whereby the adjusting nut may be adjusted to a predetermined torque and thereby place a predetermined tension load on the latch eye bolt and latch member; and

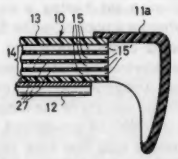
means for locking said eye bolt in its adjusted position, said locking means including a jam nut threaded on the latch eye bolt for abutting contact with a bushing loosely interposed on the latch eye bolt between the jam nut and the adjusting nut, a spring member disposed on the latch eye bolt for applying pressure against the jam nut, the adjusting nut being adjustable to a predetermined load and the jam nut then being adjustable to overcome the pressure of the spring member and to move the bushing into tight engagement with the adjusting nut thereby locking it into place.

4,320,913

SHOCK ABSORBING BUMPER FOR VEHICLES

Shigeharu Kuroda, 1-13 Tomigaoka 5-chome, Nara, Japan

Filed Oct. 26, 1979, Ser. No. 88,817
Int. Cl.³ B60R *21/14*
U.S. Cl. 293—120 14 Claims



1. A shock absorbing bumper for vehicles comprising:

an elongated bumper body;

a pair of end members attached to opposite ends of said bumper body;

a metal support for supporting said bumper body and serving as a secondary shock absorber;

said bumper body including an outer layer and an internal central bumper portion serving as a first shock absorber;

said outer layer being of one piece construction formed of synthetic resin material by a single process of extrusion molding so as to provide an equal cross section at every point along said bumper body;

said central bumper portion having a plurality of axial bores and web portions;

each of said axial bores having end openings and said bores extending through the entire length of said bumper body;

said web portions being disposed among said axial bores and extending through the entire length of said bumper body; and

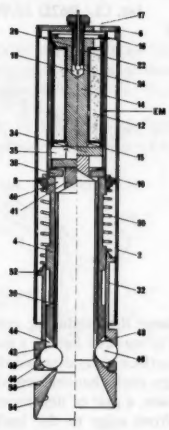
said metal support being formed by a bent sheet metal member so as to absorb shocks transmitted through said central bumper portion.

4,320,914

CLAMPING-TYPE HOLDER

Avi Simon, Beer Sheva, Israel, assignor to Beta Engineering & Development Ltd., Beer Sheva, Israel

Filed May 9, 1980, Ser. No. 148,483
Claims priority, application Israel, Jul. 27, 1979, 57914
Int. Cl.³ B66C 1/42
U.S. Cl. 294—88 **7 Claims**



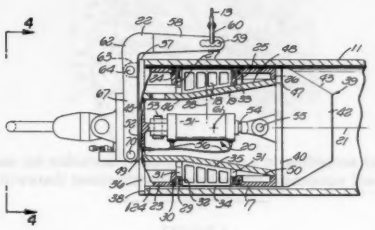
1. A clamping-type article holder, comprising: a housing including coaxial inner and outer cylinders; a first sleeve carried by said housing and axially movable along the inner face of the first cylinder from a first position to a second position; a plurality of balls carried by said housing and adapted to project through openings formed in one end of the first sleeve for clamping the article when the sleeve is in said first position; a second sleeve axially movable between said inner and outer cylinders; said second sleeve having a cam surface engageable with the balls for urging same to project through the openings in the first sleeve to clamp the article when the first sleeve is in its article-clamping position; said one end of the first sleeve being formed with a cam surface effective, upon axial movement of the first sleeve to said second position, to withdraw the balls from the openings and thereby to release the article; and retaining means for retaining said first sleeve in said second, article-releasing position.

4,320,915

INTERNAL ELEVATOR

Roderick K. Abbott, Villa Park; Padmasiri D. Seneviratne, Fullerton, and Daniel P. Juhasz, Westminster, all of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Mar. 24, 1980, Ser. No. 133,501
Int. Cl.³ B66C 1/56
U.S. Cl. 294—96 **16 Claims**



6. An internal elevator for lifting a tubular member comprising:

an outer body adapted to be received within said tubular member and having an essentially tubular side wall containing openings;

a plurality of slips mounted within openings in said sidewall of said body for movement radially inwardly and outwardly relative thereto and having radially outer gripping faces engageable outwardly against said tubular member to grip and support it;

an inner essentially tubular body within said outer body and movable axially relative thereto and having a connection adapted to be attached to a supporting element in a manner suspending said inner body therefrom;

said inner body having flaring radially outer camming surface areas engaging radially inner camming surfaces of said slips and acting upon axial movement of said inner body relative to the outer body and slips to cam said slips radially outwardly against the tubular member; and

a piston and cylinder mechanism contained within said inner body and having its piston and cylinder connected at axially spaced locations to said outer body and said inner body respectively in a relation to actuate the inner body axially relative to the outer body and relative to said slips and to cam the slips radially outwardly against said tubular member.

4,320,916

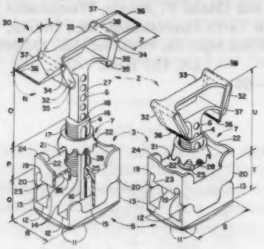
EQUIPMENT CARRYING AND, OR, SECURING DEVICE

John M. Crump, 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Aug. 4, 1980, Ser. No. 175,081
Int. Cl.³ A45F 5/10
U.S. Cl. 294—147 **11 Claims**

1. In a device for assembling, carry and/or securing any combination of ski equipment, or the like, such as boots, skis and poles, cooperable retention units, comprising a base member with an upstanding externally threaded, hollow column member with symmetrically related chambers for skis, a retention unit slideably engaged with said hollow column member, and an apertured column retention unit telescopically received within said hollow column member, said hollow column member having an internally threaded adjustable securing means engaged therewith and cooperating with an adjustment pin engaged within an aperture in said columned retention unit, the

consequential operation of said cooperable retention units together with said securing means all relative to said base



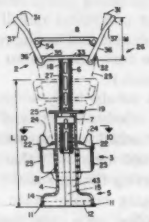
member according to a predetermined relationship for assembling said equipment into releasable securement therewith.

4,320,917

EQUIPMENT CARRYING AND, OR, SECURING DEVICE

John M. Crump, 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Aug. 11, 1980, Ser. No. 176,787
Int. Cl.³ A45F *5/10*
U.S. Cl. 294—147 **14 Claims**



1. In a device for carrying and/or securing any desired combination of equipment such as skis, poles and boots comprising: oppositely disposed retainer means symmetrically related and movably mounted in a mutually aligned relationship relative to a first and second column member, said retainer means selectively movable by manipulation of a securing means releasably communicating with said first column member and rotatably supported interiorly at the upper terminus of said second column member, one of said retainer means cooperating with a base member and said securing means such that the consequential assembling of any selected combination of equipment such as boots, skis and poles causes said equipment to be releasably secured therewith.

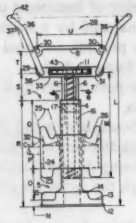
4,320,918

EQUIPMENT ASSEMBLING, CARRYING AND, OR, SECURING DEVICE

John M. Crump, 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Aug. 18, 1980, Ser. No. 179,093
Int. Cl.³ A45F *5/10*
U.S. Cl. 294—147 **21 Claims**

1. A device for carrying and/or securing any desired combination of equipment such as skis, poles and boots comprising:
first retention means for releasable engagement with oppositely disposed boot toes;
second retention means for releasable engagement with oppositely disposed boot heels;
means provided with one of said retention means to retain said skis and poles therewith;
first column assembly and second column member cooperating with said retention means for supporting and guiding the selective manipulation of said retention means into cooperative engagement with said equipment; and manipulatable securing means releasably engaged to said second column member and adjustably disposed on said first



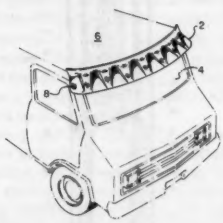
column member; said securing means comprises an elongated member having threads located circumferentially along the longitudinal axis with an adjustment means disposed at one extremity, said adjustment means rotatably mounted and releasably supported within an aperture located in a hand grasp structure.

4,320,919

AERODYNAMIC VISOR

James P. Butler, Lewisville, Tex., assignor to Affiliated Hatch and Sunroof, Inc., Dallas, Tex.

Filed Dec. 21, 1978, Ser. No. 971,649
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **4 Claims**



1. An aerodynamic drag reducing vehicular visor comprising a single sheet of material having a plurality of air channels along its lower surface extending substantially from a front edge to a back edge, each channel formed by, with reference to the top of said visor, a pair of depressions extending substantially from the front edge to the back edge of said visor wherein each of said depressions is flat-bottomed and has a width which decreases from said front edge to a point near said back and then abruptly decreases between said point and said back edge.

4,320,920

AIR DEFLECTOR DUCT

Robert B. Goudey, 3 Selwyn Crescent, Kanata, Ontario K2K 1N7, Canada

Filed May 9, 1980, Ser. No. 148,266
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **4 Claims**

1. An air deflector for application to the rear corners of a vehicle such as a transport trailer, bus, van or the like comprising elongated inner and outer plates and deflector ribs interconnecting and spacing said inner and outer plates apart; said inner plate being shaped to generally conform to the contour of a rear corner of said vehicle and said outer plate having a

curved portion to direct air rearwardly and inwardly of said vehicle corner; and means on the inner plate of the deflector

for releasably securing the deflector on the rear corner of a vehicle with the inner plate in face-to-face contact with at least one surface of the vehicle corner.

4,320,921

SLIDING ROOF FOR MOTOR VEHICLES

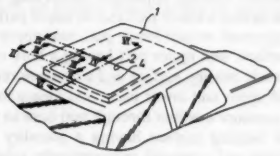
Walter Schätzler, Gaunting, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jun. 11, 1980, Ser. No. 158,392

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923904

Int. Cl.³ B60J 7/04

U.S. Cl. 296—213 9 Claims



1. Sliding roof assembly for motor vehicles comprising a translucent rigid sliding cover, said cover closing a roof opening in its closed position and being slidable down and out of this position and behind a fixed rear roof part, a sliding headlining, said sliding headlining being slidable relative to said sliding cover and jointly movable with said sliding cover, first engagement means for automatic engagement of the sliding headlining, when said sliding cover is opened, and for displacing said sliding headlining with said cover to an open position, where said sliding headlining disappears completely behind a stationary frame cover, second engagement means for automatic engagement of the sliding headlining, when the sliding cover is closed, and for transport of said sliding headlining to an intermediate open position in which the sliding headlining projects out of said stationary frame cover, said first and second engagement means being rigidly connected to said sliding cover and downwardly projecting therefrom.

4,320,922

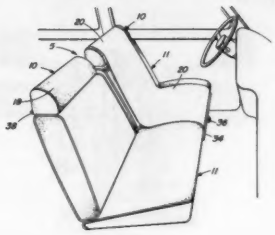
STORABLE AUTOMOTIVE SEAT COVER

Alexanderos Meritis, 419 N. Linwood Ave., Baltimore, Md. 21224

Filed Mar. 19, 1980, Ser. No. 131,718

Int. Cl.³ A47C 31/10

U.S. Cl. 297—220 9 Claims



1. A storable automotive seat cover, comprising:

an adjustable head rest, said head rest being suitably configured as a hollow, box-like, compartment, said hollow, box-like compartment having one side hinged as an access door, said access door being located on the rearward side of said head rest;

a cylindrical core member, said cylindrical core member being affixed inside said hollow, box-like, compartment of said head rest, said cylindrical core member having a ratchet means at one end thereof;

a seat cover fabric, said seat cover fabric being suitably affixed to said cylindrical core member and rolled-up thereon;

a support means, said support means being affixed inside said head rest, said support means serving to affix said cylindrical core member inside said head rest, said support means having at least one inclined surface thereon and a holding slot, said inclined surface serving to guide said ratchet means into said holding slot.

4,320,923

METHOD FOR SOLUTION MINING OF URANIUM ORES

Bernard C. Lawes, and John C. Watts, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 739,967, Nov. 8, 1976, abandoned. This application Feb. 26, 1979, Ser. No. 15,209

Int. Cl.³ E21B 43/28; C01G 43/00

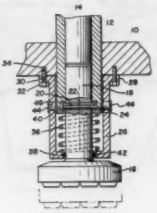
U.S. Cl. 299—5 5 Claims

1. In a process for the solution mining of a uranium ore formation where an aqueous carbonate leaching solution containing an oxidant is passed through the ore formation to dissolve uranium from the formation therein and the solution is withdrawn from the ore formation enriched in uranium, the improvement comprising preventing permeability loss by passing through the ore formation, which otherwise would thereby have a permeability loss, aqueous ammonium carbonate leaching solution having a pH of 7–10, and which has dissolved therein an oxidant selected from the group consisting of hydrogen peroxide, molecular oxygen and a mixture thereof and a small amount of alkali metal silicate effective to restore the permeability.

4,320,924
RECIPROCATED CONCRETE SURFACER MEMBER WITH SHIELDED SPRING RETURN

Edward R. Langfield, Glen Rock; James L. Hile, Montville, and David L. Hird, Pompton Lakes, all of N.J., assignors to Elco International, Elmwood Park, N.J.

Filed May 16, 1980, Ser. No. 150,609
Int. Cl.[3] B28D 1/26
U.S. Cl. 299—37 15 Claims



1. A scabbler for removing a surface portion of concrete, rock and the like and having a reciprocating bit with an outer downwardly directed portion adapted to act on said surface, said scabbler having a cylinder in which a reciprocated rod is movable, said scabbler including:

(a) a base member disposed to accept and retain at least one cylinder in a determined orientation with the cylinder extending below the base a determined amount;

(b) a bit with an attached shank of a reduced and substantially constant diameter, said shank having one end adapted to be engaged and moved by said reciprocated rod;

(c) a retainer adapted to enclose nearly all of that shank of the bit when said bit is at its upward extent;

(d) means for securing the retainer to a fixed member and provide external protection of the attached bit shank from dust, dirt, slurry and the like;

(e) a compression spring disposed around the shank of the bit and when mounted and in operating condition adapted to urge the bit shank toward the reciprocated rod;

(f) a washer slidable on said shank of the bit with said washer restrained from further upward movement along said shank of the bit by a retaining pin insertable in and carried in an aperture formed in said shank, said washer providing means for retaining an upper end of said spring and urging said shank upwardly;

(g) means for retaining a lower end of said spring to the lower end of the retainer, and

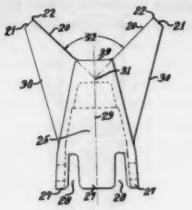
(h) means for sealing the retainer at its lower end so as to provide external protection of the bit shank as it is reciprocated, this seal excluding the shank and interior of the retainer from dust, dirt, slurry and the like.

4,320,925
DREDGE CUTTERHEAD TOOTH

Stephen M. Bowes, Jr., Jacksonville, Fla., assignor to Florida Machine & Foundry Co., Jacksonville, Fla.

Filed Feb. 14, 1980, Ser. No. 121,390
Int. Cl.[3] E21C 35/18; E02F 9/28
U.S. Cl. 299—90 58 Claims

1. In a rock cutting tooth assemby for a generally conical dredge cutterhead or the like including a female recess in the rearward end of a base of a tooth having a longitudinal axis and adapted to interfit with a forward male end of an adapter affixed to the cutterhead, and releasable means for locking said tooth onto the adapter, the improvement comprising an elongated tooth having a cutting face extending substantially lengthwise of said tooth and a flank extending substantially transverse to said face, the intersection of said cutting face and said flank forming the cutting edge of said tooth, said cutting face being angularly divergent outwardly from said longitudinal axis, said cutting face lying in a plane which intersects said longitudinal axis at a location inwardly of the base of the tooth,

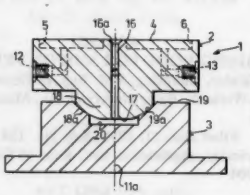


said cutting edge being substantially perpendicular to said longitudinal axis when projected in the same plane.

4,320,926
HYDROSTATIC BEARING APPARATUS

Otto Heinemann, Ennigerloh; Helmut Lücke, Beckum; Werner Schossler, Ahlen; Burkhard Heiringhoff, Oelde, and Helmut Krumme, Wadersloh, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Jul. 14, 1980, Ser. No. 167,804
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931364
Int. Cl.[3] F16C 32/06
U.S. Cl. 308—9 12 Claims



1. Hydrostatic bearing apparatus comprising at least one bearing shoe having a lower part and an upper part tiltably and rotatably supported on said lower part, said upper part having a bearing surface, said upper part having a bore communicating between said bearing surface and a pressure relief chamber between said upper and lower parts; and means for delivering a hydraulic pressure medium through said bore to said bearing surface, said bearing surface having a plurality of pressure pockets therein and arranged symmetrically relative to said bore.

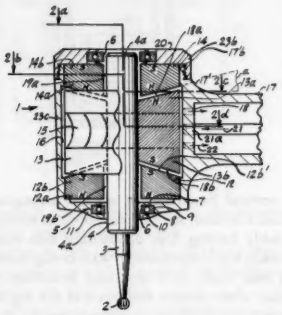
4,320,927
DENTAL DRILL WITH MAGNETIC AIR TURBINE HAVING MAGNETIC BEARINGS

Anthony T. Sertich, 30 Dover Green, Staten Island, N.Y. 10300

Filed Mar. 21, 1980, Ser. No. 132,512
Int. Cl.[3] F16C 39/06
U.S. Cl. 308—10 9 Claims

1. A magnetic bearing unit comprising in combination: a support structure; at least two spaced-apart magnets in the form of first and second annuluses coaxially aligned and both mounted fixedly onto said support structure, the magnets of said first and second annuluses having unlike magnetic poles facing one-another for annulus faces in juxta-position spaced-apart relationship, as a first annulus face of said first annulus and as a second annulus face of said second annulus; and a third magnet in the form of a third annulus mounted around and fixedly onto an elongated shaft, the third annulus being coaxi-

ally aligned with said first and second annuluses and positioned between said first and second annuluses in spaced-away relationship from both the first and second annuluses with said shaft extending through a least an aperature of one of said first and second annuluses axially thereof and in spaced-away relationship from the annulus inner wall, said third magnet having like-magnetic poles adjacent in relationship to adjacent said first and second annulus faces such that each of said first and second annuluses are repelled magnetically by the magnetic forces of said third annulus; said third magnet having a third face in opposing magnetic relationship to said first annulus face and having a fourth face in opposing magnetic relationship to said second annulus face in said relationship of magnetically



repelling said first and second annuluses; at least one set of (1) said first and second annuluses faces, and (2) said third and fourth faces, being substantially concavely-angled, and the remainder of (1) said first and second annuluses faces, and (2) said third and fourth faces being substantially convexly-angled such that said third and fourth faces as opposite end-faces of said third annulus are substantially seated one within the other of said first and second annulus faces as opposing faces in juxtaposition spaced-away relationship exerting both axially-directed and transversely extending repelling forces relative to a longitudinal axis of said elongated shaft whereby said elongated shaft is forcefully suspended against both axial and lateral movement, by outside forces acting on said shaft.

4,320,928

DRIVE MEANS FOR A TWIN SCREW EXTRUDER

Siegfried Chszaniecki, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

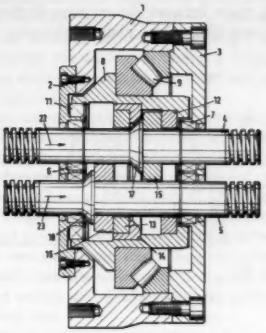
Filed Sep. 9, 1980, Ser. No. 185,550

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939094

Int. Cl.³ F16C *35/06*; F04B *23/14*

U.S. Cl. 308—207 R **2 Claims**

1. In drive means for a twin screw extruder, comprising a pair of drive shafts mounted in a housing and each to be connected to a drive and to a respective one of the screws of the extruder, bearing means comprising a thrust ring surrounding both of said drive shafts; an axial roller bearing supporting said thrust ring in said housing; a pair of coaxial butting rings inserted in and secured against rotation with respect to said thrust ring, said coaxial butting rings being off-set from one another in an axial direction and surrounding said two drive shafts; and a respective shaft thrust ring for each said drive shaft secured thereon against relative rotation, said two shaft thrust rings being off-set from one another in an axial direction



with each said shaft thrust ring bearing against a respective one of said butting rings.

4,320,929

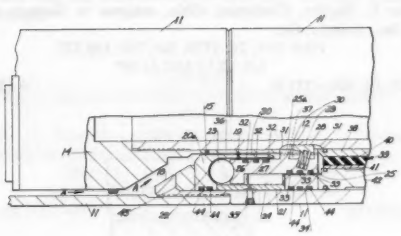
SEALED BEARING SYSTEM FOR HYDRAULICALLY OPERATED DEVICES

Wallace Clark, and Albert S. Goldstein, Jr., both of Indianapolis, Ind., assignors to Oncor Corporation, Houston, Tex.

Filed Aug. 20, 1980, Ser. No. 179,819

Int. Cl.³ F16C *19/10*

U.S. Cl. 308—230 **15 Claims**



1. A sealed bearing assembly for rotatably journaling a shaft relative to a concentric housing surrounding said shaft, comprising an annular pocket secured to said housing, said pocket having a bottom wall and opposing side walls, bearing means in said pocket, an annular bearing support in said pocket positioned to maintain said bearing means in contact with the walls of said pocket, attachment means securing said bearing support to said shaft, and sealing means interposed between said bearing support and the opposing side walls of said pocket, whereby said housing and said shaft are rotatably mounted relative to each other and a bearing lubricant may be sealed in said pocket.

4,320,930

AXIAL ROLLER BEARING FOR ROLLING MILLS

Heinrich Winter, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,297

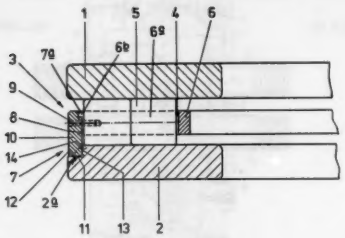
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 7918792[U]

Int. Cl.³ F16C *19/30*

U.S. Cl. 308—234 **4 Claims**

1. An axial roller bearing assembly comprising at least one

pair of annular disc members having confronting raceway surfaces, means defining an annular pocket in an edge of one of the annular disc members having a radial surface, a plurality of rollers in the space between the raceway surfaces, a cage for the rollers comprising a base plate confronting one axial end



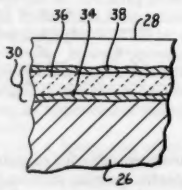
face of the rollers, a plurality of spaced projections defining roller pockets and a locking ring connected to the outer terminal ends of said projections having a ring shaped extension which projects axially on the side facing said one bearing disc member beyond the base plate and rests with a front surface on said radial surface.

4,320,931

INSULATING BEARING AND METHOD OF MANUFACTURE

Don L. Shaffer, Cincinnati, Ohio, assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Dec. 26, 1979, Ser. No. 106,722
Int. Cl.³ F16C *33/00*
U.S. Cl. 308—237 R **9 Claims**



1. A plain bearing for a dynamoelectric machine, said bearing being adapted to be received in a stationary member and to receive a rotating member and provide electrical isolation there-between, comprising:

a bearing shell having an outer surface and a inner surface within which the rotating member is to be disposed;

an inner layer of bearing material formed in said bearing shell for slidingly supporting the surface of the rotating member; and

insulating means disposed between said bearing shell and said bearing material and physically bonding said shell and said bearing material together, including;

(i) a base layer in intimate contact with said bearing shell,

(ii) a ceramic layer overlying said base layer, and

(iii) a metallic adhesion layer between said ceramic layer and said layer of bearing material;

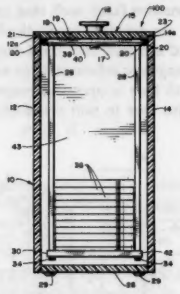
whereby said layers permanently bond said inner layer of bearing material to said bearing shell to form a monolithic structure whose inner, bearing surface is electrically isolated from its outer, shell surface.

4,320,932

VERTICAL BREADBOX OR THE LIKE

Lloyd Giffin, 60 Fifth St., Woodland, Calif. 95695

Filed Apr. 25, 1980, Ser. No. 143,616
Int. Cl.³ A47B *81/00*; A47G *19/32*
U.S. Cl. 312—71 **7 Claims**



1. A vertical breadbox or other receptacle having a top section and a bottom section; said bottom section comprising a hollow body having four upstanding side walls normal to a bottom wall, each upstanding wall being normal to the next adjacent side wall, such that said breadbox is of square or rectangular cross-section and open at the top thereof, the top edge of each side wall tapering downwardly and inwardly at a defined angle,

the top section of which is adapted to slidably rest within said bottom section and which comprises a generally flat first plate, the edges of which taper downwardly and inwardly at the same angle as the side wall taper,

a second plate sized slightly smaller secured beneath said first plate, and a connector plate under mounted on said second plate, sized the same as said second plate,

four L-sliders having first and second ends mounted normal to said connector plate, at one end of said L-sliders,

a resting plate secured to each of said sliders at the second end of said sliders, said resting plate being disposed parallel to said connector plate, and adapted to float inside said hollow body, due to

the elevation of said sliders being less than the elevation of said side walls,

whereby said top section removably sealingly engages said bottom section.

4,320,933

VENDING MACHINE WITH COMMON PANEL STRUCTURE

Cristian J. Felix, Flushing, N.Y., and Donald M. Genaro, Haworth, N.J., assignors to PepsiCo Inc., Purchase, N.Y.

Filed Jan. 15, 1980, Ser. No. 112,172
Int. Cl.³ A47B *77/08*; B47B *81/00*
U.S. Cl. 312—223 **4 Claims**

1. A vending machine providing for easy and convenient on site repair of the machine in the event of damage thereto, comprising:

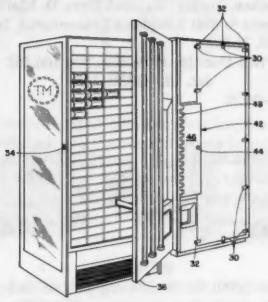
a. a housing including a frame structure with top, front and side surfaces, said front surface being an openable door affording access to interior portions of the machine;

b. vend operating means including product selection switches, coin insertion and return means, and a product dispensing opening being arranged along one side of the front surface of said machine;

c. a first removable, decorative panel being detachably mounted on said front surface, said panel covering the major portion of said front surface while leaving said vend operating means exposed;

d. at least one further removable, decorative panel identical to said first panel being located on at least one of the side surfaces of said machine and being substantially coextensive with the side surface;

e. detachable moldings on said side surface for mounting said further panel, and means for fastening said moldings to



said side surface accessible only from the interior of the machine upon opening of said door

whereby a portion of said molding is adapted to be removed through loosening of said fastenings to facilitate slidable disengagement of said further panel and replacement therewith of said first panel on said front surface when said first panel has been damaged or vandalized.

4,320,934

PULL-OUT GUIDE FOR DRAWERS

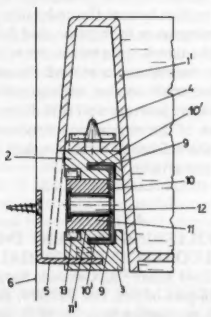
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jun. 4, 1979, Ser. No. 45,266

Claims priority, application Austria, Jun. 13, 1978, 4287/78; Oct. 31, 1978, 7767/78

Int. Cl.³ A47B *88/08*

U.S. Cl. 312—331 **5 Claims**



1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein the drawer is slidably insertable into and removable from a furniture body, said assembly comprising:

a plastic drawer side wall having a substantially inverted V-shaped cross-section;

a first holding member attached to said drawer side wall at a position within said V-shaped cross-section thereof, said first holding member comprising a substantially solid elongated plastic first block extending over only along slightly more than the rear half of the length of said drawer side wall;

a second holding member adapted to be attached to a side wall of a furniture body adjacent said drawer side wall, said second holding member comprising a substantially solid elongated second block having a length to extend only along slightly more than the front half of the length of the furniture body side wall;

said first and second blocks having formed therein respective first and second elongated L-shaped guiding grooves;

said first and second blocks having formed in confronting surfaces thereof respective first and second racks;

an elongated rail having a substantially U-shaped cross-section including a vertical web connecting spaced horizontal first and second flanges, said rail being mounted in said first and second blocks for sliding movement relative thereto, with said first and second horizontal flanges being positioned within said first and second guiding grooves, respectively; and

a cog wheel rotatably mounted about a horizontal axis to said vertical web of said rail at a position midlength thereof said cog wheel extending transversely between said first and second blocks, said cog wheel having a first axial length portion in the form of a pinion meshing with both said first and second racks, and said cog wheel having a second axial length portion which is tooth-free and which rollingly contacts surfaces of said first and second blocks;

whereby movement of the drawer into and from the furniture body will cause said first rack to rotate said pinion with respect to said first and second racks, and thereby causing relative longitudinal movement of said cog wheel and said rail with respect to both said first and second blocks.

4,320,935

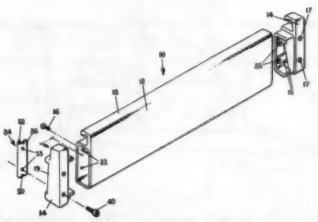
STRUCTURAL SUPPORT SYSTEM WITH LOAD CONTROL

Robert A. Nagelkirk, Holland, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 22, 1979, Ser. No. 87,430

Int. Cl.³ A47B *51/00, 57/00;* E04G *3/00*

U.S. Cl. 312—350 **12 Claims**



1. In a mounting system for detachably securing cabinets or the like to a wall comprising

a pair of spaced, elongated, vertical support members, each including a plurality of clip-receiving apertures;

at least two clips including means for releasably securing said clips to the vertical support members; and

an elongated rail for supporting storage members in a fixed position relative to said vertical support members, said clips being adjustably mounted to said elongated rail;

the improvement which comprises:

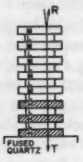
means for adjusting the angular position of the rail about a horizontal axis relative to said clips from a position external to the rail.

4,320,936

FAR ULTRAVIOLET DIELECTRIC MULTILAYER FILM

Mitsuharu Sawamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,083
Claims priority, application Japan, Sep. 27, 1978, 53-118757
Int. Cl.³ G02B 5/28, 5/22
U.S. Cl. 350—1.6 5 Claims



1. An ultraviolet multilayer film which reflects beams of light in the far ultraviolet region but transmits beams of light in other wavelength regions, said ultraviolet multilayer film comprising:

a substrate;

a first group of thin films provided on said substrate and comprising alternate layers of high refractive dielectric having a refractive index not less than 1.9 and low refractive dielectric having a refractive index not more than 1.5; and

a second group of thin films provided on said first group of thin films and comprising alternate layers of intermediate refractive dielectric having a refractive index between 1.5 and 1.9 and low refractive dielectric having a refractive index not more than 1.5;

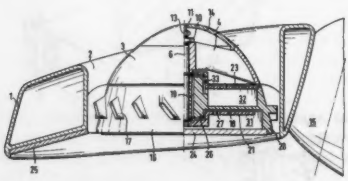
said refractive indices being determined in the wave length region of 200–300 nm.

4,320,937

ROTATABLE MOTOR VEHICLE MIRROR

Fritz Schwerk, Jutastrasse 26, 8000 Munchen 2, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,788
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904825
Int. Cl.³ G02B 5/08, 7/18; B60R 1/06
U.S. Cl. 350—62 4 Claims



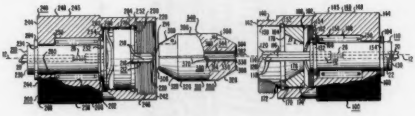
1. A rotatable motor vehicle mirror comprising a rotor structure supported on a shaft, said structure having a bore passage receiving said shaft and carrying a mirror at one end thereof, a plurality of suction bores passing through the rotor structure adjacent said shaft and having inlet and outlet ends disposed on the axially opposed sides of said rotor, and a fan unit disposed adjacent the outlet ends of said bore passages for aspirating air from said suction bores and passing it to the rear side of the mirror, said suction bores offering relatively high resistance to the aspirated air flow so that subatmospheric pressure is produced at the outlet ends of the suction bores, there being bearing clearance between the shaft and rotor structure such that the presence of subatmospheric pressure at the outlet ends of such bores produces an aspirated air flow cushion between the shaft and rotor bore passage, said rotor shaft having an axial bore passing end-to-end thereof for communicating additional air flow to said fan unit, and adjustable air access regulating means carried on the other end of said shaft for controlling the amount of additional air flowing through said shaft bore.

4,320,938

RESILIENT OPTICAL FIBER CONNECTOR

Carl E. Gunnersen, Tucker, Ga., and Terry D. Mathis, Mequon, Wis., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1979, Ser. No. 106,552
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 22 Claims



3. An article (300) for facilitating precise end-to-end axial alignment of mating light-transmitting optical fibers (26) in first and second mating fiber termination structures (112, 212), each termination structure comprising an aligning structure containing at least one optical fiber with a mating end, where each termination structure has a predetermined cross section and a mating end face (114, 214) including the mating end of the contained fiber, and where at the end face the fiber is held in a precise position in relation to at least one precise-aligning outer surface means (122, 222) of the aligning structure, the article comprising:

first (310) and second (340) rigid elongated members, each having an inner longitudinally-extending surface means (312, 342), at least the inner surface means of the first member including precise-aligning reference surface means (332) for engaging the outer surface means of the termination structures to achieve precise alignment of the fiber termination structures in the article; and

means for resiliently maintaining (370) the inner surface means of the members in a facing relationship to define a fiber termination structure receiving orifice (380) with a cross section having a first dimension normally smaller than a corresponding first dimension of said predetermined cross section, where the maintaining means is capable of deforming so as to increase said first dimension for insertion of the termination structures at either end of the article while maintaining a second dimension of said receiving orifice cross section orthogonal to said first dimension and then decrease said first dimension to urge the surface means of the termination structures into registration against the reference surface means to thereby align the fibers in the article.

4,320,939

OPTICAL FILTERING ELEMENT INCLUDING FLUORESCENT MATERIAL

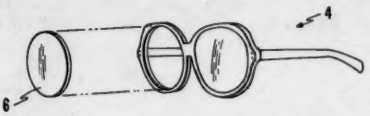
Gary E. Mueller, 2103 Essex La., Colorado Springs, Colo. 80903

Continuation-in-part of Ser. No. 917,079, Jun. 19, 1978, abandoned. This application Sep. 13, 1979, Ser. No. 74,911
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ G02C 7/10
U.S. Cl. 351—44 14 Claims

1. A substantially solid, dry, substantially transparent optical filter element which absorbs, on the average, from about 10% to about 99%, and transmits, on the average, from about 90% to about 1% visible radiation having wavelengths in the range of about 400 nm to about 700 nm including:

optical means, said optical means including at least one substantially discrete fluorescent means having two op-

posed surfaces, said fluorescent means including fluorescent material which is substantially stable and which has the ability to absorb transversing visible radiation of one or more wavelengths which is incident on one surface of said fluorescent means and to then emit visible radiation from its opposed surface, substantial amounts of said emitted radiation being at different wavelengths than the radiation absorbed, said fluorescent means being of a thickness of no greater than about 1 mil (0.0254 mm) between its opposed surfaces so that the incident side of said fluorescent means does not scatter, reflect or emit substantial amounts of radiation.



4,320,940

OPTICAL FILTERING ELEMENT

Gary E. Mueller, 2103 Essex La., Colorado Springs, Colo. 80903, and Timothy D. Ziebarth, 4641 Huey Cir., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 917,081, Jun. 19, 1978, abandoned. This application Sep. 13, 1979, Ser. No. 74,912

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ G02C *7/10*

U.S. Cl. 351—44 **29 Claims**

1. A substantially solid, dry, substantially transparent optical filter element which absorbs, on the average, from about 10% to about 99%, and transmits, on the average, from about 90% to about 1% visible radiation having wavelengths in the range of about 400 nm to about 700 nm including: optical means, said optical means including at least one substantially discrete fluorescent means having two opposed surfaces, said fluorescent means including fluorescent material which is substantially stable and which has the ability to absorb transversing visible radiation of one or more wavelengths which is incident on one surface of said fluorescent means and then to emit visible radiation from its opposed surface, substantial amounts of said emitted radiation being at different wavelengths than the radiation absorbed, said fluorescent means being of a thickness of no greater than about 1 mil (0.0254 mm) between its opposed surfaces so that the incident side of said fluorescent means does not scatter, reflect or emit substantial amounts of radiation; and non-fluorescent optical means substantially parallel and in light transmitting optical relationship to said optical means.

4,320,941

OPTICAL COMPENSATORS FOR CINEMATOGRAPHY

Nigel J. R. Dashwood, Royston, and Dexter R. Plummer, Ongar, both of England, assignors to PA Management Consultants Limited, London, England

Filed Oct. 22, 1979, Ser. No. 86,797

Claims priority, application United Kingdom, Nov. 7, 1978, 29552/78

Int. Cl.³ G03B *41/10*

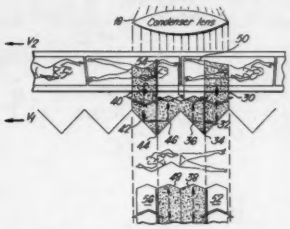
U.S. Cl. 352—111 **28 Claims**

1. An optical device for compensating for the movement of a cinematographic film along a film path, a region of which is crossed by a light path, comprising:

a plurality of image inverting facets each of which has two mutually perpendicular plane light reflecting surfaces, said facets being oriented so as to deflect all light passing therethrough, for inverting light entering the facets, and each facet being smaller in the direction of film movement than a single film frame repeat distance and having a pitch in the direction of film movement which is substantially one half the film frame repeat distance;

means for defining a path along which said plurality of facets can move, coacting points of said film and facet path being substantially equidistant from one another in the region where said film path and said facet path cross said light path;

means for moving said plurality of facets along said facet path with each facet in turn crossing said light path, the movement of said facets having a component of motion in the same direction as the movement of said film, the speed of said component being different from the speed of said film in the region where said facets and said film cross said light path and is substantially one half the speed of said film,



each said facet being constructed to interact with more than one said film frame as it crosses said light path and each said film frame being constructed to interact with more than one said facet as it crosses said light path, wherein at no time does a complete immobilized image formed from the film frames relate identically to one of the film frames contributing to that immobilized image.

4,320,942

POSITION COMPENSATION MECHANISM FOR A MOVIE CAMERA

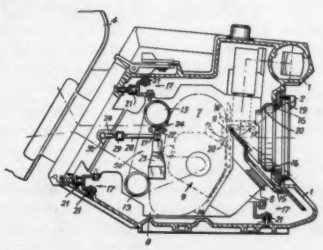
Fritz Bauer, Loquaiplatz 13/26, A-1010 Vienna, Austria

Filed Oct. 14, 1980, Ser. No. 197,000

Claims priority, application Austria, Mar. 1, 1980, 29/80

Int. Cl.³ G03B *17/02*

U.S. Cl. 352—242 **18 Claims**



1. A movie camera comprising an outer housing and an inner housing disposed within said outer housing, said inner housing having a predetermined orientation with respect to said outer housing when said outer housing is in a normally operative position, film gate means supported on said inner housing, said

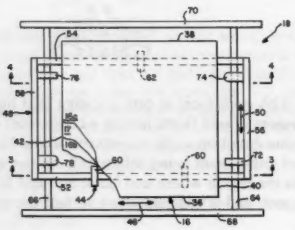
outer housing including photographic optic mounting means for supporting photographic optics, mounting means for mounting and orienting said inner housing with respect to said outer housing when said outer housing is in said first normally operative position, and position compensation means operatively coupled to said inner housing and said outer housing for maintaining the orientation of said inner housing with respect to said outer housing when said outer housing is displaced from said first normally operative position.

4,320,943

CARRIAGE SUPPORT ARRANGEMENT FOR A MICROFICHE READER

William T. Link, Berkeley, Calif., assignor to Diagraphix, Inc., San Diego, Calif.

Filed Mar. 4, 1980, Ser. No. 127,127
Int. Cl.³ G03B *23/08*
U.S. Cl. 353—27 R **8 Claims**



1. In a microfiche reader including a projection screen and an optical arrangement adapted to cooperate with a microfiche for providing an enlarged image of the latter onto said screen, an assembly for supporting said microfiche for planar movement within the confines of a given rectangular area within a predetermined plane, said assembly comprising:

(a) carriage means for fixedly containing said microfiche within said plane, said carriage means including a front end, an opposite back end and opposite sides extending from said front end to said back end;

(b) first means supporting said carriage means and therefore said microfiche for movement along a first straight-line path laterally from one side of said area to an opposite side thereof; and

(c) second means supporting said carriage means and said first means for movement along a second straight-line path normal to said first path from one end of said area to an opposite end thereof, said second means including

(i) first and second spaced apart tracks extending between said opposite ends parallel with said second path,

(ii) first and second bearing means fixedly connected with and slidably engageable along said first and second tracks respectively, said first bearing means being located adjacent the back end of said carriage means and said second bearing means being located adjacent the front end of said carriage means regardless of the position of said carriage means within said area, and

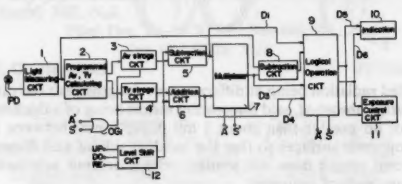
(iii) first and second guide means unconnected with but slidably engageable along said first and second tracks, respectively, said first guide means being located adjacent the front end of said carriage means and said second guide means being located adjacent the back end of said carriage means regardless of the position of the latter.

4,320,944

PROGRAMMABLE EXPOSURE CONTROL SYSTEMS FOR A CAMERA

Masaaki Nakai, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1979, Ser. No. 29,919
Claims priority, application Japan, Apr. 18, 1978, 53-46331
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—23 D **18 Claims**



1. Exposure control system for a camera capable of aperture or shutter priority exposure mode operation comprising:

means for measuring light intensity to produce a first signal including information of the light measurement;

means for producing at least a second signal indicative of either the aperture value or the time value according to said first signal in a programmed relationship;

means for storing said second signal prior to actual photography to retain said second signal as the priority data with a subsequent change of said first signal;

first means for determining either the aperture size or the exposure time in accordance with said first signal influenced by the subsequent change and said stored second signal; and

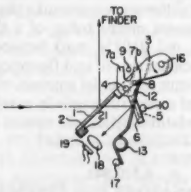
second means for determining the other of the aperture size or the exposure time commensurate with said either the aperture size or the exposure time, whereby the priority data is automatically obtainable by means of the light measurement prior to actual photography.

4,320,945

APPARATUS FOR DRIVING SUB-MIRROR IN SINGLE LENS REFLEX CAMERA

Makoto Kimura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,933
Claims priority, application Japan, Feb. 5, 1980, 55-12682
Int. Cl.³ G03B *7/08, 19/12*
U.S. Cl. 354—23 R **1 Claim**



1. In a single lens reflex camera of the type which includes:

a housing;

finder optical system;

a photosensitive element for receiving the light transmitted through a photographing lens of said camera;

a first supporting member one end of which is supported swing movably about an axis within said housing;

a main mirror having a light transmitting portion formed therein, said main mirror being supported by said first supporting member for movement between a first position and a second position with the swing movement of said

first supporting member so that in the first position said main mirror reflects the photographing light transmitted through the photographing lens toward the finder optical system and in the second position said main mirror does not reflect said photographing light and blocks the inverse incident light coming from said finder optical system;

a second supporting member mounted on said first supporting member swing movably about an axis; and

a sub-mirror mounted on said second supporting member and being movable between a third position and a fourth position with the swing movement of said second supporting member so that in the third position said sub-mirror reflects the photographing light transmitted through said light transmitting portion of the main mirror toward said photosensitive element and in the fourth position said sub-mirror blocks the inverse incident light transmitted through the finder optical system and said light transmitting portion and does not reflect said photographing light, the improvement comprising:

a spring supported by said housing;

a stationary member provided within said housing;

a spring anchoring part formed integrally with said second supporting member and being biased by the working end of said spring for transmitting said biasing force to said sub-mirror, said spring anchoring part being disposed on said second supporting member in such manner that when said main mirror is in the first position it biases said sub-mirror to the third position, when said main mirror is in the second position it biases said sub-mirror to the fourth position and when said sub-mirror is in a particular position between said third and fourth positions, the direction of biasing force is reversed; and

a branched part formed integrally with said second supporting member and comprising first and second branches opposed to each other so that said stationary member may be present between and apart from the first and second branches, said first and second branches remain out of contact with said stationary member when said sub-mirror is in the third position and in the fourth position, said first branch comes into contact with said stationary member at the initial step of movement of said main mirror from the first position to the second one so that said sub-mirror is moved from the third position to said particular position with a further movement of said main mirror against the biasing force of said spring thereby reversing the direction of the biasing force of said spring at said particular position, and said second branch comes into contact with said stationary member at the initial step of movement of said main mirror from the second position to the first one so that said sub-mirror is moved from the fourth position to said particular position with a further movement of said main mirror against the biasing force of said spring thereby reversing the direction of the biasing force of said spring.

4,320,946

CAMERA FOCUS DETECTING DEVICE

Harumi Aoki, Kiyose; Katsuhiko Miyata, Ageo, and Yoshio Sawada, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

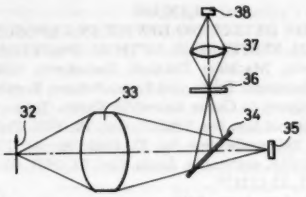
Filed Feb. 4, 1980, Ser. No. 117,932

Claims priority, application Japan, Feb. 13, 1979, 54-15254

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—25 **6 Claims**

1. A focus detecting device for a camera comprising: a self-scanning type photoelectric element having a plurality of microphotoelectric elements and a scanning circuit for producing a contrast signal of an image of an object to be photographed thereby to automatically detect a point of proper focus; an average illumination detecting photoelectric element for detecting average brightness in a plane perpendicular to the optical axis of an optical image; an optical system for forming on said average illumination detecting photoelectric element the image of said object from which a high spatial frequency component is removed; and a pulse generator for generating a clock pulse signal for driving said self-scanning type photoelectric elements, the frequency of said clock pulse signal varying with the magnitude of an output of said average detecting photoelectric element wherein as the brightness of said object



increases, the frequency of said clock pulse signal increases to thereby produce a contrast signal free from variations due to changes in brightness of said object and from which have been removed variation components of said contrast signal due to movement of said object.

4,320,947

CAMERA WITH AUTOMATIC FOCUSING DEVICE

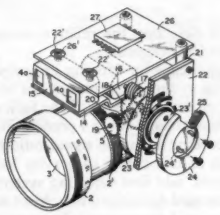
Yoshio Komine, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,825

Claims priority, application Japan, Dec. 26, 1979, 54/180502[U]; Dec. 28, 1979, 54/184287[U]

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—25 **3 Claims**



1. A camera with an automatic focusing device, comprising:

a picture-taking lens comprising a focusing lens; and

an automatic focusing unit accommodated in a space above said picture-taking lens and inside the camera body comprising:

a range-finding device provided with photosensor elements and optical systems adapted for generating a signal corresponding to the distance from the camera to the object;

drive means positioned behind said range-finding device and provided with a motor for driving said focusing lens;

signal generating means for indicating the focus position of the focusing lens, said means being positioned parallel to the lateral face of the camera at a side of said motor and being composed of a digital switch board consisting of a printed circuit board having digital code patterns and fixed to a base plate and of a rotary plate supporting contact brushes maintained in sliding contact with said printed circuit board and adapted to rotate in response to said focusing lens drive means, thus generating a signal corresponding to the focus position of said focusing lens;

an electric circuit adapted for controlling said motor in response to the signal from said range-finding device

and the focus position signal from said focusing lens; and

a circuit board having said electric circuit thereon and so positioned as to cover said range-finding device and said drive means.

4,320,948

MOTION DETECTING DEVICE IN EXPOSURE CONTROL SYSTEM FOR OPTICAL INSTRUMENT

Kazuya Hosoe, Machida; Tokuichi Tsunekawa, Yokohama; Makoto Masunaga, Tokyo, and Toshio Sakane, Kodaira, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

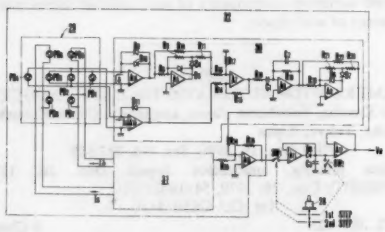
Continuation of Ser. No. 949,557, Oct. 10, 1978, Pat. No. 4,264,161. This application Jul. 22, 1980, Ser. No. 171,253

Claims priority, application Japan, Oct. 12, 1977, 52-122175; Oct. 12, 1977, 52-122177

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ G01J *1/20;* G03B *7/083*

U.S. Cl. 354—31 **26 Claims**



1. A device for detecting the relative motion between an object and the device, comprising:

(A) image forming means for forming an image of an object;

(B) a first detecting system for detecting the movement of the position of the center of gravity of the light quantity distribution of the object image along a predetermined first direction and for providing an output signal indicating whether or not the position of said center of gravity has moved along said first direction, said first detecting system including:

(B-1) means arranged to receive the object image along the first direction, said image receiving means providing an electrical output corresponding to the received radiation;

(B-2) means for receiving the electrical output of the image receiving means and providing an output signal which varies with the change in the center of gravity of the light quantity distribution of the object image along the first direction;

(B-3) means for normalizing the output signal of the output receiving means with object brightness information to provide an output signal indicative of the position of said center of gravity along the first direction; and

(B-4) means for detecting the variation of the output signal of the normalization means to provide said output signal indicating whether or not the position of said center of gravity has moved along the first direction;

(C) a second detecting system for detecting the movement of the position of the center of gravity of the light quantity distribution of the object image along a predetermined second direction substantially perpendicular to the first direction and for providing an output signal indicating whether or not the position of said center of gravity has moved along the second direction, said second detecting system including:

(C-1) means arranged to receive the object image along the second direction, said image receiving means providing an electrical output corresponding to the received radiation;

(C-2) means for receiving the electrical output of the image receiving means and providing an output signal which varies with the change in the center of gravity of the light quantity distribution of the object image along the second direction;

(C-3) means for normalizing the output signal of the output receiving means with object brightness information to provide an output signal indicative of the position of said center of gravity along the second direction; and

(C-4) means for detecting the variation of the output signal of the normalization means to provide said output signal indicating whether or not the position of said center of gravity has moved along the second direction; and

(D) output means for providing an output signal indicating the existence of the relative motion between the object and the device along any direction, by combining the output signals of the first and the second detecting systems with each other.

4,320,949

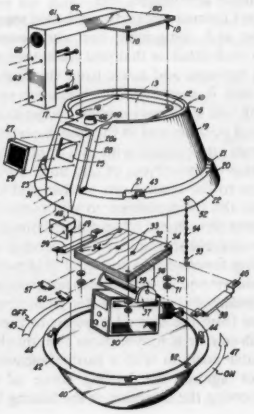
WEATHERIZED HOUSING ASSEMBLY FOR CAMERA

Raymond V. Pagano, 2734 Penwood Pl., Lithonia, Ga. 30058

Continuation-in-part of Ser. No. 663,558, Mar. 3, 1976, abandoned, and a continuation of Ser. No. 883,143, Mar. 8, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 71,933

Int. Cl.³ G03B *37/02, 29/00;* H04N *5/26*

U.S. Cl. 354—81 **29 Claims**



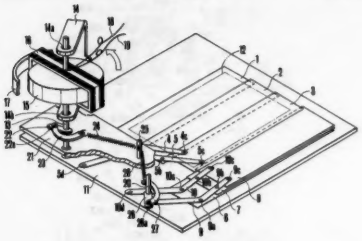
29. A housing assembly of the type having a cover, with an open bottom end, a camera, a dome across said open bottom end, said cover and said dome forming an essentially open interior for housing said camera, the combination therewith of thermostatic means within the interior defined by said cover and said dome for detecting the temperature within said interior and temperature control means controlled by said thermostatic means for varying said temperature within said interior, there being provided openings in sad housing in spaced relationship to each other, for the exchange of air between the interior and exterior of said assembly, one of said openings being in spaced relationship to said temperature control means, said air circulating throughout the open interior, said control means including a heater disposed in said housing for heating the air in said interior and a fan mounted on said cover, said cover having one of said openings adjacent to said fan through which air passes when said fan is actuated, said openings being respectively in said dome adjacent to said fan and adjacent to the junction of said dome and said cover.

4,320,950

ELECTROMAGNETICALLY DRIVEN SHUTTER

Michio Senuma, Tokyo; Yoji Sugiura, Yokohama, and Fumio Shimada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 18, 1980, Ser. No. 207,980
Claims priority, application Japan, Nov. 20, 1979, 54-150241
Int. Cl.[3] G03B *9/08, 9/40*
U.S. Cl. 354—235 7 Claims



1. An electromagnetically driven shutter comprising:

shutter blade means for controlling the opening and closing of a photographic optical path in accordance with displacement;

a permanent magnet member, said member forming a magnetic field along a predetermined fixed direction;

a movable conductor member, said member being arranged in the magnetic field of the permanent magnet so as to be displaced when a current runs through the member along a predetermined direction, while said member connected to the shutter blade means in such a manner that in accordance with the displacement of said member the shutter blade means open and close the photographic optical path; and

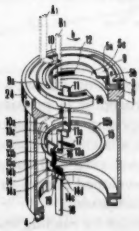
urging spring means for applying an urging force to the movable conductor member along the direction along which the exposure operation of the shutter blade means is accelerated so that at the starting point of the exposure operation by means of the shutter blade means the driving force of said means is zero and gradually increases toward the termination of the exposure operation.

4,320,951

EXTENSION TUBE FOR CAMERA

Tohru Kawai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 162,325
Claims priority, application Japan, Jun. 27, 1979, 54-82089
Int. Cl.[3] G03B *17/00*
U.S. Cl. 354—286 12 Claims



1. An extension tube adapted to be connected between a camera body which includes a movable actuating member, and an interchangeable lens assembly which has an optical axis and which includes an exposure control mechanism and a first member for actuating the exposure control mechanism, said extension tube comprising:

(a) an elongated tubular body arranged to be coupled with the camera body at one end of said tubular body, and to be coupled with the lens assembly at the other end of said tubular body;

(b) means within said tubular body including a second member for engaging the first member of the lens assembly in response to actuating movement of the actuating member in the camera body; and

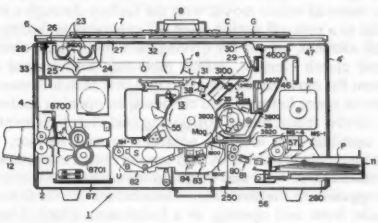
(c) means within said tubular body for interchanging the positional relationship between the first member in the lens assembly and said second member of said engaging means, said interchanging means adjusting the positional relationship to maintain an operative association between the first member and the second member so that the second member can actuate the first member when said tubular body is coupled to the camera body.

4,320,952

SHEET TRANSPORT IN ELECTROPHOTOGRAPHIC COPYING APPARATUS

Ryubun Seimiya; Akira Shinozaki; Isao Nosaka, and Fumio Iwai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,061
Claims priority, application Japan, Jan. 17, 1978, 53/4097
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 SH 4 Claims



1. In a transfer type electrophotographic copying apparatus having a copy board for supporting an original to be copied, an optical system, an exposure source for illuminating the original, a rotatable photosensitive drum, means for relatively moving the copy board and optical system to project an image of the original on the drum and thereby form on the drum an electrical charge particle pattern corresponding to the projected image of the original, toner means for converting the electrical charge particle pattern into a visible toner image on the drum, means for moving a transfer paper along a path including a position of contact with the drum, transfer electrode means disposed at said contact position for forming an electric field between the transfer electrode means and the drum such that the toner image is transferred to the transfer paper as the paper moves through said drum contact position of said path of movement, and means for heating the transfer paper after leaving said drum contact position so as to melt the toner image on the paper and thereby fix the image thereon, the improvement comprising:

said rotatable photosensitive drum having a seamless photosensitive layer about its peripheral surface, and

said heating means comprising at least a rotatable heating roller containing a heating element, and a pressure-contact roller rotatable in a condition of pressure-contact with the heating roller, said transfer paper being moved along said path into pressure-contact relation between said rollers,

the distance from said contact position of the transfer paper with the drum to the pressure-contact point of said heating

and pressure-contact rollers being less than the length of the transfer paper as measured in the direction of movement of the paper along said path.

4,320,953

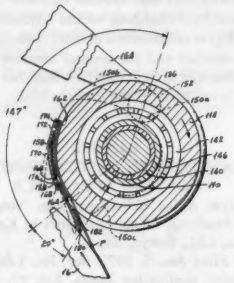
PICK-OFF DEVICE FOR ELECTROSTATIC COPIER

Max Schultes, Old Tappan, N.J., and Dietmar Eberlein, New City, N.Y., assignors to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 858,246, Dec. 7, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,863

Int. Cl.³ G03G *15/00*; B65H *29/56*

U.S. Cl. 355—3 SH **22 Claims**



1. In a copying machine of the image transfer type in which an image developed on a surface is transferred to a sheet of copy material which moves with the surface through a transfer station to a pick-off station, pick-off apparatus including a first clutch element, means for driving said first clutch element, a second clutch element, means mounting said second clutch element for movement relative to said first clutch element with a narrow space between said elements, an opening leading into said narrow space, means positioning said clutch elements with said opening at a location adjacent to said surface, means including a blade carried by said second clutch element and for movement therewith, said blade extending generally in a direction opposite to the direction of movement of said first clutch element from said opening to a location at which it engages said moving surface to intercept the leading edge of a copy sheet moving with said surface to strip a portion of said sheet away from said surface and to direct said portion into the space between said elements, the relationship between the thickness of said sheet and the space between said elements being such that entry of said sheet into said space clutches said elements to each other for movement as a unit, and means responsive to a predetermined movement of said elements as a unit for moving said elements relative to each other to free said portion of said copy sheet.

4,320,954

DRIVE MECHANISM FOR AN IMAGE TRANSFER TYPE COPYING APPARATUS

Hiroshi Ikeda, Aichi, and Koji Takeuchi, Gamagori, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1979, Ser. No. 108,273

Claims priority, application Japan, Jan. 9, 1979, 54-1467

Int. Cl.³ G03G *15/00*

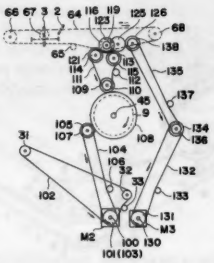
U.S. Cl. 355—3 R **5 Claims**

1. A drive mechanism for an image transfer type copying apparatus which comprises;

an original scanning means movable in one direction for scanning an image of original to be copied and returnable in the opposite direction to its initial position;

a rotatable photosensitive member and including thereabout at least a charging means for uniformly charging the surface of the photosensitive member, an exposure slit through which the image of an original is successively projected, a rotatable developing means for developing an electrostatic latent image formed on the photosensitive member, an image transfer means for transferring the developed image onto copying paper and a cleaning means for removing residual toner;

a first drive means including a first motor for rotating said photosensitive member and for forwardly moving said original scanning means, said original scanning means



being moved for scanning as a scan clutch therefor is energized: and

a second drive means including a second motor independent of said first motor for driving said developing means and for reversably moving said original scanning means, said original scanning means being moved in the reverse direction for return as said scan clutch is deenergized when a return clutch is energized.

4,320,955

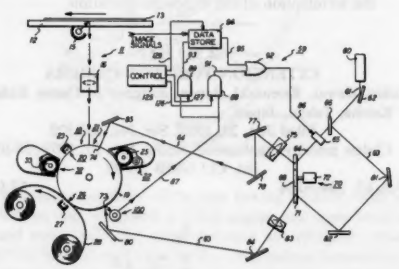
COPY REPRODUCTION APPARATUS

David B. Kay, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1980, Ser. No. 111,554

Int. Cl.³ G03G *15/04, 15/30*; H04N *1/30*

U.S. Cl. 355—3 R **18 Claims**



1. In a copying apparatus having a photoreceptor, means to charge said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to an original to produce a latent electrostatic image thereof, developing means for developing said image, and transfer means for transferring said developed images to copy substrate material, the improvement comprising:

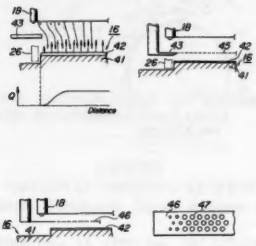
image reading means for reading images on said photoreceptor to produce image signals representative of said image; and

image writing means for exposing said photoreceptor in accordance with said image signals to reproduce said latent electrostatic image on said photoreceptor to provide duplicate images without using said original.

4,320,956
ELECTROPHOTOGRAPHIC APPARATUS INCLUDING A SCREEN MEMBER FOR DECREASING SIDE EDGE ELECTROSTATIC CHARGE

Masaji Nishikawa; Muneo Kasuga, and Tomoki Funakubo, all of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 10, 1980, Ser. No. 128,563
Claims priority, application Japan, Mar. 12, 1979, 54-29248
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 CH **11 Claims**

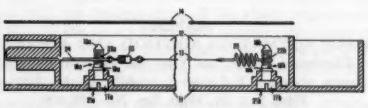


1. An electrophotographic apparatus comprising:
a photosensitive member having an electrically conductive substrate and a photosensitive layer which is applied on the substrate and has a width narrower than a record paper;
a corona charger for uniformly charging the photosensitive member;
an optical system for projecting an image of a document to be duplicated onto the uniformly charged photosensitive member to form an electrostatic latent image;
a device for developing the latent image with toners to form a toned image;
a device for transferring the toned image onto the record paper;
a pair of screening members made of electrically conductive material and arranged at side edges of the photosensitive member, respectively, between the corona charger and the photosensitive member for gradually decreasing the quantity of electrostatic charge at the side edges of the photosensitive member toward the side edges; and
a variable bias voltage supply source connected to said conductive screening members.

4,320,957
CORONA WIRE ADJUSTER

Leon C. Brown, and Stanley L. Pond, both of Boulder, Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 30, 1980, Ser. No. 154,734
Int. Cl.³ G03G *15/02*; H01T *19/04*
U.S. Cl. 355—3 CH **16 Claims**

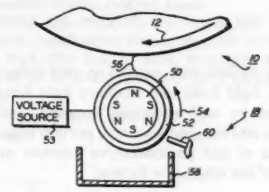


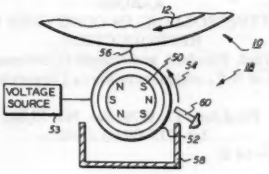
12. An electrophotographic copier having a rotatable photoconductive drum, a corona charging apparatus for charging said drum, an exposure station for generating a latent electrostatic image on said drum, and a toner station disposed about the periphery of said drum for developing the latent electrostatic image, the corona charging apparatus comprising:
a corona housing and a corona wire adjacent thereto, facing the surface of said drum, a stub member having a shank with a spiral thread thereon, and means for mounting said stub member on said housing, in a rotatable but otherwise fixed position, with said spiral thread engaging said corona wire,
whereby rotation of said stub member causes said corona wire to ride said spiral thread and move along said shank.

4,320,958
COMBINED PROCESSING UNIT

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1980, Ser. No. 200,681
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DD **14 Claims**





1. An apparatus for cleaning particles from a surface in one mode of operation and depositing particles thereon in another mode of operation, including:
means for transporting particles from the surface during the cleaning mode of operation and to the surface during the depositing mode of operation;
means for producing a magnetic field extending about said transporting means; and
means for controlling said producing means so that the strength of the magnetic field about said transporting means in the region of the surface is weak during the depositing mode of operation and strong during the cleaning mode of operation.

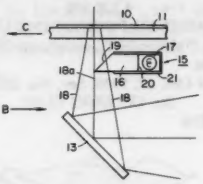
4,320,959
AUXILIARY EXPOSURE DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS

Teruo Morikawa, Sagamihara, and Shinji Murata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,925
Claims priority, application Japan, Feb. 19, 1979, 54-18802
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—11 **27 Claims**

1. An electrophotographic apparatus, comprising:
a movable photosensitive member;
an original holder having a surface for placing an original to be copied thereon;
original illiminating means for illuminating the original;
an imaging lens for forming an image of the original on said photosensitive member;
a separate auxiliary light forming means; and
a reflecting member for reflecting the light from said auxil-

iary light forming means, said reflecting member being located optically between said original holder aand said imaging lens and at a position corresponding to an end portion of an area over which the light reflected by the original passes, said auxiliary light forming means being located substantially at a conjugate position with the



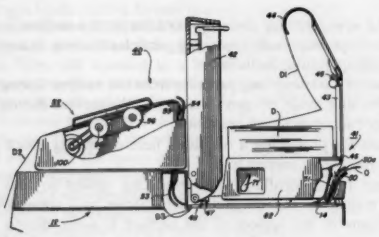
original surface with respect to said reflecting member, and the light from said auxiliary light forming means is reflected by said reflecting member, and is incident, through said imaging lens, on a portion adjacent an end of the area of said photosensitive member over which an image of the original is formed.

4,320,960

SENSOR CONTROLLING IN COMPUTER FANFOLD REPRODUCTION

Joseph W. Ward, Pittsford, and Russell G. Schroeder, II, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1979, Ser. No. 75,868
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **9 Claims**



1. In a reproduction machine adapted to handle document material in the form of a computer fanfold web consisting of a plurality of frame sections and being formed with equally spaced openings along one or both edges for cooperation with a tractor drive for imparting movement of the web, the machine having a processor for reproducing copies of the frames positioned on an exposure platen, the combination of:

control system associated with the tractor drive for advancing the web to position the frames upon the platen manually or automatically,

sensing means arranged in the path of movement of the web and adapted to sense the openings along an edge of the web material,

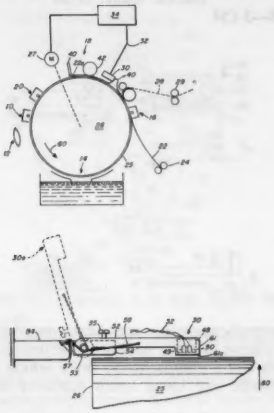
circuit means connected to said sensing means and arranged to produce a frequency of pulses in accordance with the sensed rate of openings movement, and control means associated with said circuit means for effecting the shutdown of the machine in the event said frequency of pulses deviates from a reference frequency.

4,320,961

JAM DETECTING APPARATUS AND METHOD FOR ELECTROSTATIC COPIER

Austin E. Davis; Raymond G. Cormier, both of Nashua, and Peter M. Coombs, Wilton, all of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed Jan. 28, 1980, Ser. No. 115,715
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **8 Claims**



1. A method for correcting a sheet jam condition in a photocopier having a transfer station and a cleaning station, said cleaning station having at least a wiper blade extending across, and adaptable for pressure contact with, a moving photosensitive recording surface, the method comprising the steps of:

detecting the presence of a sheet material on the photosensitive recording surface at a position between the transfer station and the cleaning station wiper blade;

forming a buckle in said sheet between said transfer station and said cleaning station wiper blade; and

terminating movement of said photosensitive surface a selected time duration after said sheet presence is detected, said time duration having a magnitude sufficient to enable said sheet material to at least contact said cleaning station wiper blade before movement of said photosensitive surface terminates,

whereby said buckle forms in said sheet between said transfer station and said cleaning station wiper blade for facilitating removal of said sheet material from said copier, said buckle comprising a portion of said sheet material out of contact with said photosensitive recording surface.

4,320,962

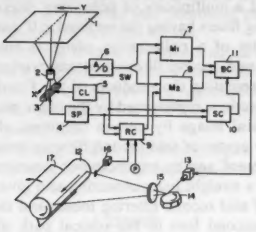
IMAGE FORMATION METHOD AND APPARATUS

Tohru Takahashi, Tokyo, and Yasuyuki Tamura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,409
Claims priority, application Japan, Oct. 2, 1979, 54/127036
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **10 Claims**

1. A method of forming an image by combining different original images, said method comprising the steps of photoelectrically converting a plurality of original images to be combined into time-sequential signals and storing the time-sequential signals in predetermined memory means, reading out the memory signals corresponding to the original images

stored in said memory means with a predetermined time relationship therebetween and combining the desired memory



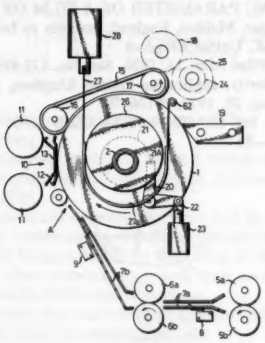
signals to obtain an image signal, and forming an image in accordance with the combined image signal.

4,320,963

ORIGINAL FEEDING SYSTEM

Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Dec. 13, 1979, Ser. No. 103,234
Claims priority, application Japan, Dec. 19, 1978, 53-155811
Int. Cl.[3] G03B 27/46, 27/62; B65H 5/12
U.S. Cl. 355—50 1 Claim



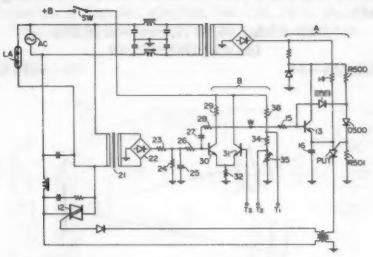
1. An original feeding system comprising: a rotary drum;
an exposing region where a sheet original carried by the drum is exposed for projecting its image through an optical system to a photosensitive surface;
original feeding rollers for supplying the sheet original to the rotary drum;
sheet original hold-down claws mounted on the rotary drum for clamping the leading edge of the sheet original against the surface of the periphery of the rotary drum; and
sheet original hold-down claws control means for keeping the sheet original hold-down claws in clamping engagement with the leading edge of the sheet original during rotation of the rotary drum and releasing the sheet original hold-down claws from clamping engagement therewith in an original releasing position; wherein the improvement comprises:
drive means consisting essentially of a plurality of belts for frictionally driving the rotary drum and for feeding the sheet through the exposing region while holding the sheet between the belts and the rotary drum; and
means for temporarily stopping rotation of the rotary drum until passing of an unexposed portion of the sheet through the exposing region is finished, before the rotary drum returns to its original position following completion of one revolution, said rotary drum temporarily stopping means comprising a friction member for frictionally engaging the rotary drum and applying a frictional braking force gradually varying in accordance with the angle of rotation of the rotary drum; said rotary drum temporarily stopping means comprising a brake belt controllable by a brake solenoid and an eccentric cam disc secured to the rotary drum, with the brake belt engaged at least partly around the cam disc so that rotation of the rotary drum and cam disc, with activation of said solenoid causes increasing frictional interaction between said brake belt and said cam disc.

4,320,964

IMAGE FORMATION APPARATUS

Masato Ishida, Yokohama; Katsuyoshi Maeshima, Tokyo, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1979, Ser. No. 53,088
Claims priority, application Japan, Jun. 30, 1978, 53-79307; Jul. 6, 1978, 53-82273; Jul. 6, 1978, 53-82274; Jul. 6, 1978, 53-82275; Jul. 6, 1978, 53-82276; Jul. 6, 1978, 53-82277; Jul. 20, 1978, 53-82682
Int. Cl.[3] G03B 27/73
U.S. Cl. 355—69 25 Claims



1. An image formation apparatus comprising:
process means for forming an image on a recording medium;
first input means for manually setting the density of the image formed on said recording medium to a desired value;
first control means for controlling the power supplied to said process means in response to the setting of said input means to form the image of the desired density set by said input means;
second input means for adjusting said power; and second control means for controlling said first control means in response to said second input means to shift the range of the power controllable by said first control means while the variation rate of the density is substantially constant.

4,320,965

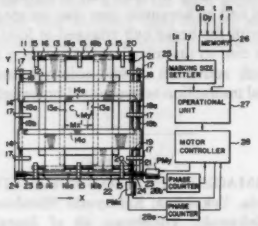
AUTOMATIC MASKING DEVICE FOR USE IN A PRINTER

Yoshikazu Kimura, Kusatsu; Kenziro Tanabe, and Hiroyuki Yonehara, both of Hikone, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 7, 1980, Ser. No. 128,179
Claims priority, application Japan, Mar. 19, 1979, 54-32085
Int. Cl.[3] G03B 27/58
U.S. Cl. 355—74 7 Claims

1. An automatic masking device for use in a printer, comprising:
(a) a photosensitive film sheet holder on which a photosensitive film sheet is to be held; and
(b) a pair of masking plates which are separated at a certain distance away from the surface of the holder, and are adapted to be movable over the surface of the holder so as to open and close the opening distance between the mask-

ing plates, the opening distance between said masking plates being a function of the size of a reproduction picture to be projected onto the photosensitive film sheet on



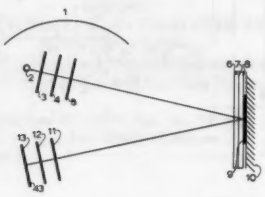
the holder, the magnification of the projected picture reproduction and the distance between said masking plates and said photosensitive film sheet holder.

4,320,966

FOURIER PROCESSOR OF PHOTOELASTIC DATA AND METHOD OF USING SAME

Zinovy V. Reytblatt, 3550 N. Lake Shore Dr., Chicago, Ill. 60657

Filed May 16, 1979, Ser. No. 39,582
Int. Cl.[3] G01B *11/18*
U.S. Cl. 356—34 16 Claims



1. A method for optical determination of A- and B-potentials, and strains and rotation averaged over the depth of photoelastic coating bonded to the prototype, and of strains and rotation on the surface of said prototype by

bonding said photoelastic coating to said prototype said coating comprising a slab of photoelastic material and first filtering means and reflecting means, said first filtering means being dichroic films being built in said slab; loading said prototype thus inducing strains therein; projecting a first beam of light containing at least two components polarized in different planes the wavelengths of said components being essentially different toward said photoelastic coating;

transmitting first components of said first beam of light and reflecting second components of said first beam of light using said first filtering means;

reflecting said first components of said first beam of light from said reflecting means of said photoelastic coating; filtering said first and second components of said first beam of light returning from said photoelastic coating in planes substantially perpendicular to the initial planes of polarization of said first and second components of said first beam of light; recording permanently a first optical image thus created; projecting second beams of collimated coherent monochromatic light of wavelengths of components of said first beam of light toward said permanent first optical image;

placing in the optical path of said second beams of light from said first optical image a first lens creating second images in the focal plane of said first lens said second images representing the Fourier transforms of functions represented by the color densities of said first optical image;

filtering said second beam of light from said second images using second filtering means placed in the optical path of said second beams, their center being on optical axis, said second filtering means comprising a sequence of a density filter and a multiplicity of polarizing filters each of said polarizing filters having the inclined at 0° and 45° to radius orientation of a polarization plane at any given point thereof, said second filtering means producing third images representing the products of the Fourier transforms of the functions represented by the color intensities of said first optical image by certain functions of the distance from the center of said second filtering means to a given point thereof, and by trigonometric functions of an angle between a straight line connecting said given point to the center of said second filtering means and the horizontal;

placing a second lens in the optical path of said second beams of light, said second lens receiving the light from the said third image and projecting said second beams of light toward suitable receiving means recording thus created permanent fourth optical images, said fourth optical images representing the Fourier inversions of functions represented by the said third images;

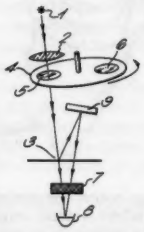
scanning and measuring densities of said fourth images; scaling, adding and subtracting the functions represented by said intensities of said fourth images whereby to obtain said potentials, said strains and said rotations.

4,320,967

APPARATUS FOR MEASURING A RADIATION AFFECTING PARAMETER OF A FILM OR COATING

Roger F. Edgar, Maldon, England, assignor to Infra-Red Engineering Ltd., United Kingdom

Filed Mar. 12, 1980, Ser. No. 129,810
Claims priority, application United Kingdom, Apr. 9, 1979, 12398/79; Aug. 28, 1979, 29736/79
Int. Cl.[3] G01N *21/86*; G01B *11/06*
U.S. Cl. 356—51 14 Claims



1. An apparatus for determining or controlling at least one parameter which represents at least one property of a film or coating capable of transmitting electromagnetic radiation, comprising:

means for defining a sample zone in which a sample of the film or coating can be received;

a source of electromagnetic radiation;

radiation responsive detector means;

optical filter means for deriving a plurality of beams of radiation of differing spectral compositions from said source;

optical directing means so arranged that:

(a) said plurality of beams are directed from said source to said sample zone;

(b) a part of each of said plurality of beams, which is transmitted by said sample when present, is directed from said sample zone to said radiation responsive detector means; and,

(c) a part of each of said plurality of beams, which is reflected by said sample when present, is directed from

said sample zone to said radiation responsive detector means;

diffusing means for optically combining said transmitted and reflected parts and passing said combined parts onto said radiation responsive detector means;

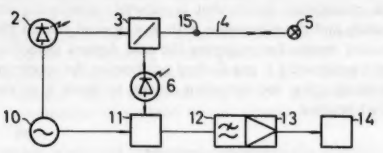
means for processing at least one output signal derived from said radiation responsive detector means so as to provide a first set of electrical signals each representing the respective summed intensity of said effective transmitted and reflected beams; and,

means for providing at least one second signal which represents a ratio of at least two of said signals of said first set.

4,320,968
FAULT LOCATION SYSTEM IN AN OPTICAL FIBER TRANSMISSION SYSTEM

Hiroharu Wakabayashi, Kawasaki, and Hideharu Tokiwa, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,396
Claims priority, application Japan, Mar. 23, 1979, 54-33254
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—73.1 **1 Claim**



1. A fault location system for an optical fiber transmission system comprising

a laser for generating an optical beam; a sweep oscillator for frequency modulating said optical beam, said sweep speed of about 100 MHz;

a half mirror mounted between said laser and an inlet of said optical fiber transmission system, said optical beam entering said inlet and being reflected by a plurality of fault points in said optical fiber transmission system with each fault point having a specified reflected frequency;

an optical receiver for converting said optical beam reflected by said fault points to electrical signals;

a modulator coupled between said sweep oscillator and said optical receiver for providing an instantaneous frequency difference between said sweep oscillator and said optical receiver;

a low pass filter coupled to said modulator, said low pass filter having a cutoff frequency of 40 KHz; and

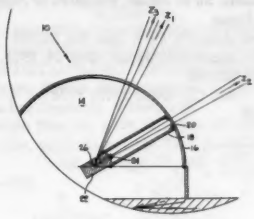
a spectrum analyzer coupled to said low pass filter for detecting said plurality of fault points.

4,320,969
METHOD AND ASSEMBLY FOR MEASURING EQUIVALENT SPHERE ILLUMINATION IN THE FIELD

John D. Green, Newark, Ohio, assignor to Manville Service Corporation, Denver, Colo.

Filed Sep. 17, 1979, Ser. No. 75,781
Int. Cl.³ G01J *356/221*
U.S. Cl. 356—221 **16 Claims**

1. An apparatus for directly assessing the quality of illumination from a lighting environment incident at a task location within said lighting environment, especially in terms of the ability of said illumination to render contrast of a standard visual task at said task location, comprising means for dividing said lighting environment into a plurality of discrete, substantially non-overlapping zones and means for generating a plurality of electrical signals, each of said signals corresponding to the luminous flux incident on said task location emanating from a selected zone of said plurality of zones, such that said plurality of said electrical signals, when positionally associated with

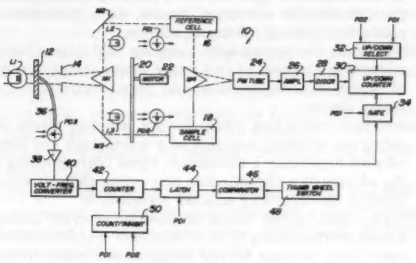


said plurality of zones, accurately describes the luminous flux distribution of said lighting environment at said task location.

4,320,970
PHOTON COUNTING FLUORIMETER

Robert M. Dowben, 7150 Eudora Dr., Dallas, Tex. 75230, and James R. Bunting, 3146 Hudnall St., Dallas, Tex. 75235

Continuation of Ser. No. 634,796, Nov. 24, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 809,138
Int. Cl.³ G01N *21/64*
U.S. Cl. 356—317 **4 Claims**



1. A photon counting fluorimeter including a source of incident light, comprising:

a sample cell containing a sample mixture with a fluorophore;

a reference cell containing said sample mixture without said fluorophore;

first means for illuminating said sample cell and said reference cell with light from said incident light source;

second means associated with both said sample and reference cells for separately detecting photons of light from said sample and reference cells and for generating a time division multiplexed series of uniform sample and reference pulses, each of said sample pulses representing a photon of light detected from said sample cell and each of said reference pulses representing a photon of light detected from said reference cell;

a third means for generating a signal representative of the number of said sample pulses relative to the number of said reference pulses generated by said second means including an up/down counter, means for causing said counter to count up when light is being received by said second means from said sample cell and means for causing said counter to count down when light is being received by said second means from said reference cell,

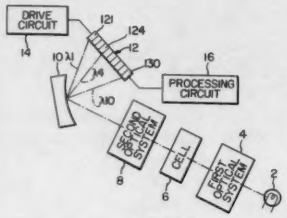
sensing means for sensing the incident light, and

means for stopping said counter from counting when said sensing means sense a predetermined amount of incident light.

4,320,971
SPECTROPHOTOMETER

Noriyoshi Hashimoto, Chofu; Mikio Ito, and Kikuo Tamura, both of Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 70,103
Claims priority, application Japan, Aug. 28, 1978, 53-103785; Aug. 28, 1978, 53-103788
Int. Cl.³ G01J 3/18, 3/38
U.S. Cl. 356—328 10 Claims



1. A spectrophotometer provided with a light diffracting element for obtaining diffracted light, comprising:

image sensor means adapted for receiving said diffracted light and having a plurality of photoelectric converting elements for respectively receiving different wavelengths of said diffracted light and for producing corresponding photoelectrically converted signals, each photoelectric converting element having an address;

drive means for sequentially scanning said photoelectric converting elements of said image sensor means in order to supply time-sequentially said photoelectrically converted signals;

wavelength instructing means having selecting means enabling the arbitrary selection of a wavelength and being adapted to produce a wavelength signal corresponding to the address of a photoelectric converting element which receives the arbitrarily selected wavelength;

address signal output means adapted to generate address signals corresponding to the addresses of the photoelectric converting elements of said image sensor means in synchronization with the scanning of said elements;

coincidence signal output means adapted to compare said wavelength signal and said address signals and to produce a coincidence signal when said wavelength signal and an address signal coincide;

circuit means including gate means responsive to said coincidence signal and adapted to receive the photoelectrically converted signals time-sequentially supplied from said image sensor means and to produce the photoelectrically converted signal corresponding to said selected wavelength in synchronization with said coincidence signal; and

processing means for receiving the selected photoelectrically converted signal and adapted to suitably process the same.

4,320,972
VACUUM SPECTROMETER HAVING A NUMBER OF REMOTELY POSITIONABLE NARROW WAVELENGTH DETECTORS

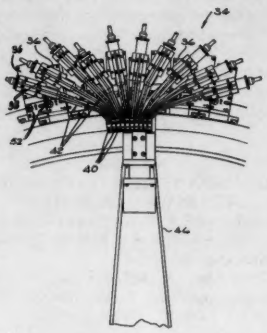
Albertus Strasheim, and Eberhard M. Thain, both of Pretoria, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Mar. 31, 1980, Ser. No. 135,584
Int. Cl.³ G01J 3/04, 3/20, 3/38
U.S. Cl. 356—328 21 Claims

1. A spectroscopic apparatus for studying a radiated spectrum, which includes

a support surface,

a plurality of detecting means for detecting radiation, displaceably supported on said surface, the detecting means each being remotely positionable at desired positions on the spectrum and each having a remotely operable clamping means for clamping the detecting means in position on said surface; and

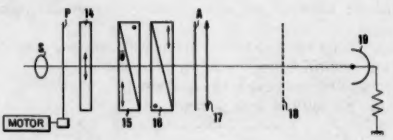


a single positioning means that is remotely selectively engageable and disengageable with any desired one of the detecting means for engaging the said desired detecting means, positioning it at a desired position on the spectrum and disengaging the detecting means to leave it at the desired position.

4,320,973
DEVICE FOR INTERFERENTIAL SPECTROMETRY WITH SELECTIVE MODULATION

Gerard Fortunato, Cachan; Robert A. Marechal, Orsay, and Marc G. Y. Menetrier, St. Ouen, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 853,551, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 656,424, Feb. 9, 1976, abandoned. This application Dec. 11, 1979, Ser. No. 102,335
Claims priority, application France, Feb. 11, 1975, 75 04264
Int. Cl.³ G01B 9/02
U.S. Cl. 356—346 4 Claims

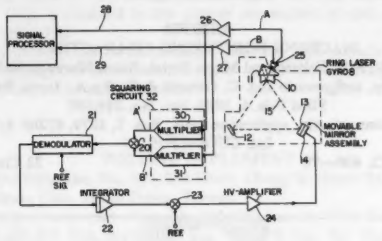


1. A high luminosity device having a light source for interferential spectrometry, which comprises in order from the light source: a polarizer, a birefringent plate, a birefringent beam splitter, an analyzer, an objective lens to bring the beams into interference, a fixed grating located at the focal plane of the objective lens, photoelectric receiver means, and means for causing relative rotation between the polarizer and the analyzer so as to form alternately on the fixed grating a given system of fringes and its complement representing the Fourier transform of the spectral distribution of the source when the polarizer and the analyzer are parallel and perpendicular respectively, said beam splitter comprising two Wollaston prisms mounted along the optical axis, said prisms being made of materials selected as a function of their birefringence and transparent over a wide range of wavelengths.

4,320,974
PATHLENGTH CONTROLLER FOR A RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 30, 1980, Ser. No. 164,195
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 10 Claims



1. In a ring laser gyroscope having a pathlength controlling movable mirror assembly and a fringe detector with dual output signals produced therefrom, the improvement comprising:

means connected at the input thereof to the detector output signals for squaring each signal separately;

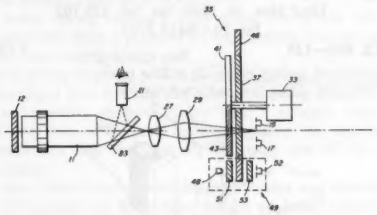
summing means connected at the input thereof to each squared signal for producing a new signal including the summation of squared output signals from the detector; and

means connected between the output of the summing means and the movable mirror assembly for maximizing laser intensity in the gyroscope.

4,320,975
PASSIVE SMOKE PLUME OPACITY MONITOR

Pedro Lilienfeld, Lexington, Mass., assignor to GCA Corporation, Bedford, Mass.

Filed Dec. 17, 1979, Ser. No. 104,314
Int. Cl.³ G01N *21/84*
U.S. Cl. 356—364 10 Claims



4. The method of determining the opacity of a smoke plume comprising:

measuring the polarized blue component of light received from the plume;

measuring the polarized red component of light received from the plume;

taking the difference between the blue and red plume light components;

measuring the polarized blue component of light received from an area of sky adjacent the plume;

measuring the polarized red component of light received from said sky area;

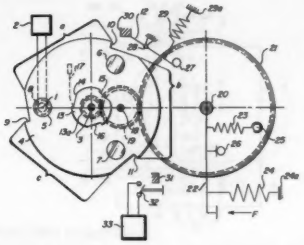
taking the difference between the blue and red sky light components; and

generating a signal which is proportional to the ratio of the first difference value to the second difference value, said signal being indicative of the transmissivity of said plume.

4,320,976
LIGHT MEASURING APPARATUS INCORPORATING MEANS FOR SHIELDING LIGHT SENSOR FOR PREDETERMINED MINIMUM TIME

Franz Obertegger, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

Filed Dec. 10, 1979, Ser. No. 102,176
Claims priority, application Italy, Dec. 1, 1978, 4879 A/78
Int. Cl.³ G01J *3/50*
U.S. Cl. 356—418 12 Claims



1. A light shielding apparatus useable with a light measuring device having a light sensor for sensing the light to be measured, a circuit for generating an error signal upon shielding of the light sensor and for generating an output signal resulting from the light sensed by the light sensor and corrected by the error signal, said apparatus comprising in combination:

(a) shielding means for shielding the light sensor to permit the circuit to generate the error signal;

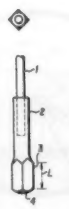
(b) a control member for manually operating said shielding means; and

(c) regulating means for regulating operation of said shielding means to shield the light sensor for a specified minimum time duration independent of the speed of manual actuation of said control member.

4,320,977
METHOD FOR OPTICALLY ASSAYING LIQUID SAMPLES WITH POLYGANOL TRANSPARENT STIRRER

Shinichiro Matsumoto, Tokyo, Japan, assignor to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,161
Claims priority, application Japan, Jun. 13, 1979, 54/74253
Int. Cl.³ G01N *21/59*
U.S. Cl. 356—427 13 Claims



1. A method for optically assaying a liquid sample which comprises placing the liquid sample in a cell for optical measurement equipped with a stirrer having a thick polygonal prism portion made of a transparent material, said polygonal

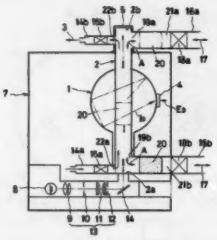
prism portion of the stirrer being positioned within the path of light used for the measurement, and measuring an optical property of the sample with stirring by rotation of the stirrer.

4,320,978

INTEGRATION SPHERE TYPE TURBIDIMETER

Ko Sato, 2-6 Fukazawa 6 chome, Setagaya-ku, Tokyo, Japan, assignor to Ko Sato and Nippon Precision Optical Instrument Co., Ltd., both of Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 96,235
Claims priority, application Japan, Dec. 12, 1978, 53-152697
Int. Cl.³ G01N *21/51, 21/53;* G01V *1/00*
U.S. Cl. 356—440 **4 Claims**



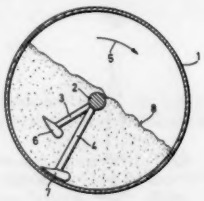
1. An integration sphere type turbidimeter comprising
(a) an integration sphere having a diameter and two diametrically opposed openings along the diameter;
(b) a cylindrical sample cell disposed along the diameter and having two ends passing through the opposed sphere openings, the cell containing
(1) a sample liquid having dispersed therein particles of a diameter of less than one micron at a concentration of less than 500 ppb;
(c) means projecting a collimated beam of light into the cylindrical cell from one end of the cell to the other end thereof, the collimated light being diffused in the cell by the dispersed particles;
(d) a light trap at said other end of the cylindrical sample cell; and
(e) a light receiving element disposed in the integration sphere for receiving the diffused light from the cylindrical sample cell.

4,320,979

MIXER

Roland Lucke, Paderborn, Fed. Rep. of Germany, assignor to Gebr. Lodige Maschinenbau GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 873,865, Jan. 31, 1978, abandoned. This application Dec. 18, 1979, Ser. No. 104,816
Int. Cl.³ B01F *7/04*
U.S. Cl. 366—325 **5 Claims**



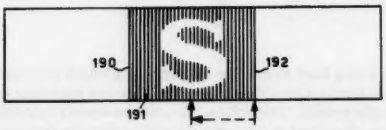
1. A mixer comprising a container having a circumferential wall, and a mixing mechanism arranged for concentric rotation with respect to the container, the said mixing mechanism comprising a rotatably mounted shaft carrying at least one radially extending arm, said arm carrying a mixing tool, said mixing tool located in the immediate vicinity of the container wall, a second mixing tool angularly fixed with respect to said first mentioned mixing tool, said second and said first mentioned mixing tool being located in the same radial plane, said second mixing tool being located at a smaller radial distance from the shaft than the said first mentioned mixing tool, said second mixing tool located at an acute angle in advance of the said first mentioned mixing tool, as considered in the direction of rotation of the mixing mechanism.

4,320,980

MACHINE FOR TYPING CHARACTERS

Gian V. Mia, Feletto, and Mario Figini, Bosco Marengo, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 6, 1980, Ser. No. 119,049
Claims priority, application Italy, Feb. 7, 1979, 67265 A/79
Int. Cl.³ B41J *29/36*
U.S. Cl. 400—70 **23 Claims**



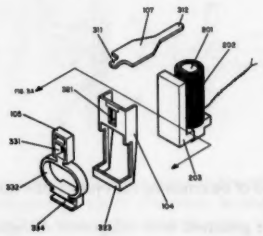
1. A machine for typing characters on a recording sheet, comprising a character-carrying member for typing the characters on typing areas of the sheet and a device for actuating the character-carrying member for successively printing a contrast sign of the said member and a character which is to be emphasized, for the respective production of a contrasting background on the typing area of the recording sheet, contrasting with respect to the background of the sheet, and visualization of the character clearly on the contrasting background of said typing area.

4,320,981

MATRIX PRINTHEAD APPARATUS

Michael Harrison, and Wilbern F. Davis, both of Austin, Tex., assignors to Data General Corporation, Westboro, Mass.

Filed Mar. 10, 1980, Ser. No. 128,702
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **3 Claims**



1. In a wire matrix printhead having a base; a plurality of axial electromagnetic structures mounted to and disposed around said base, each of said electromagnetic structures having an outer pole, a center pole and a coil disposed around said center pole; a like plurality of armatures and styli, each of said armatures and styli being associated with one of said electromagnetic structures, and each of said armatures having a stylus engaging end and an outer end; said outer end being in contact with one end of said outer pole, and armature retaining apparatus, said armature retaining apparatus comprising:

means for engaging said outer end of said armature such that undesired motion of said armature is substantially precluded;

means for mounting said apparatus on said outer pole, said means having:

spring lip means for latchingly engaging the end of said outer pole opposite from said armature contacting end such that movement of said apparatus along the length of said outer pole is substantially precluded, and

clip means for encircling said outer pole such that said apparatus is retained in the proper orientation to said outer pole; and

resilient spring means disposed between said armature engaging means and said spring lip means for applying biasing force to said armature.

4,320,982

WRITING IMPLEMENT

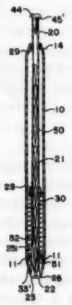
Chun-Liang Kuo, No. 328, 2nd Floor, Cheng Yi North Rd., San Chung City, Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 919,039, Jun. 26, 1978, Pat. No. 4,219,282. This application Sep. 12, 1979, Ser. No. 74,825

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.³ B43K *21/16*

U.S. Cl. 401—57 **4 Claims**



1. A writing implement comprising:

an outer casing having a converging lower end which is provided with a plurality of depressions near the top of the converging lower end;

a coil spring disposed within the outer casing, the coil spring having a free end and the other end being formed into a lead-pushing member comprising a straight wire, the lower end of the coil spring engaging the depressions provided near the converging lower end of the outer casing;

an inner tube inserted into the outer casing and through the coil spring, the inner tube having an inside channel for storing a plurality of presharpened leads therein, the lowermost end of the inner tube being formed into conical clamp portions having two diametrically opposed slots extending from the lower open end and along the longitudinal axis of the inner tube, the slots having different lengths, the first slot being about ½ the length of a presharpened pencil lead, the second slot being about four to six times the length of the first slot, the end wall at the closed end of the second slot being slanted, the wall slanting upwardly toward the upper end of the inner tube, the inside diameter of the inner tube being reduced at the lowermost end by an amount sufficient to frictionally withhold the leads therein, a first set of protrusions being disposed near the upper end of the inner tube to press against the inner surface of the upper end of the outer casing, the upper end of the outer casing being pressed in a convergent manner after the inner tube and the coil spring have been inserted into the outer casing, a second set of protrusions disposed at a distance of from about ½ to ¾ the length of the inner tube; and

a capping member adapted for covering the upper ends of the outer casing and inner tube.

4,320,983

BALL JOINT

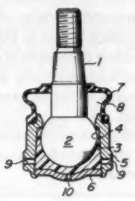
Yoshio Urasaki, Koganei, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 22, 1980, Ser. No. 171,220

Claims priority, application Japan, Jul. 31, 1979, 54-96721

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—139 **8 Claims**



1. A ball joint comprising:

a ball socket having an inner space which is open on both ends thereof;

a ball seat mounted in the inner space of the ball socket and having a spherical recess therein, said ball seat consisting of a material which absorbs moisture or water and thereby expands volumetrically;

a ball stud integral with a stud ball which is pressfitted into the spherical recess of the ball seat and slidable with respect to the ball seat;

an end cover at one end of the ball socket to hold the ball seat in the ball socket; and

a dust cover at the other end of the ball socket, through which the ball stud extends and which hermetically seals the inner space of the ball socket;

at least one of the ball socket and the end cover being formed with at least one through bore which maintains an outer surface of the ball seat in contact with ambient air.

4,320,984

ARRANGEMENT FOR CONNECTING TWO STRUCTURAL PARTS

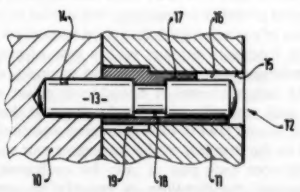
Siegfried Mayer, Vaihingen, and Arno Altpeter, Sindelfingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 160,098

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934470

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—292 **3 Claims**



1. Arrangement for connecting two structural parts while preventing relative movement thereof, comprising a blind bore in one part; a substantially coaxial through-hole in the other

part; a separate pin partially inserted in fitting manner in the blind hole of the one part and having a remaining portion which extends into the through-hole of the other part so that a free space remains in the through-hole between the remaining portion of the pin and a body of the other part; and means for filling the free space in the through-hole of the other part, said filling means including an additional sleeve inserted into the through-hole of the other part so as to surround substantially the remaining portion of the pin, and deformed by ultra-sonic waves to thereby fill the free space in the through-hole of the other part, and wherein the pin is provided with an intermediate portion of smaller diameter arranged to be located within the through-hole of the other part and forming an inwardly extending annular recess in the region of the intermediate portion of the pin, and the through-hole of the other part being provided with a counterbore portion of larger diameter forming an outwardly extending recess in the other part and facing said one part, so that when the sleeve is deformed, the material of the sleeve displaces both inwardly and outwardly into the inwardly extending recess of the pin and outwardly extending recess of the other part, and

wherein said inwardly extending recess and said outwardly extending recess are formed at axial locations which partially overlap one another.

4,320,985

APPARATUS FOR MULTIPLE SETTING OF CONCRETE PAVING BLOCKS

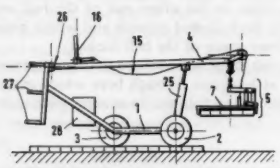
Harald Kleinemas, Saterland, Fed. Rep. of Germany, assignor to Optimas Bauelemente und Baugeräte GmbH, Verl, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,479

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853656

Int. Cl.³ E01C *19/52*

U.S. Cl. 404—99 **25 Claims**



25. Apparatus for lifting a plurality of rows of paving blocks comprising grab tong means suspended from a support, said grab tong means comprising a plurality of grab tong devices each operable to simultaneously grip a row of paving blocks laterally, each of said grab tong devices having a pair of first and second opposed jaws, said first jaw of each pair being rigidly connected to each other, first linkage means pivotally connected between said first jaws and said support for suspending each of said first jaws from said support, and second linkage means pivotally connecting each of said second jaws to said first jaw of each pair such that upon suspension of the grab tong means from said support with a row of paving blocks disposed between each pair of first and second jaws said first and second linkage means is operable to effect a clamping action on each row of paving blocks disposed therebetween, each of said second jaws of each pair being separately pivotally connected to the first jaw of the respective pair such that the distance between each pair of jaws for each row of paving blocks clamped therebetween is variable to accommodate variations in the lengths of paving block rows due to contaminates and manufacturing tolerances, whereby each pair of first and second jaws adapts itself to the individual rows of paving blocks to thereby provide lifting of each row of paving blocks according to the length of each of the rows of paving blocks and proportional to the weight of each of the rows of paving blocks being lifted.

4,320,986

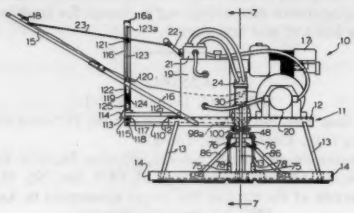
MOTOR POWERED ROTARY TROWEL

Donald R. Morrison, 2109 Camp Green St., Charlotte, N.C. 28208

Filed Mar. 21, 1980, Ser. No. 132,636

Int. Cl.³ E01C *19/22*

U.S. Cl. 404—112 **7 Claims**



1. A concrete surface working apparatus comprising:

(a) a frame structure;

(b) a reversible, hydraulic motor mounted on said frame structure and having a vertical drive shaft;

(c) a gasoline driven engine, a hydraulic pump driven by said engine and an associated oil reservoir and hydraulic control all mounted on said frame structure and providing means for energizing and controlling said motor enabling said shaft to be caused to stop or be selectively driven in either direction;

(d) a plurality of radially arranged trowel blades having opposed parallel longitudinal working edges and tiltably mounted on support means arranged to be driven by said shaft, said motor, engine, hydraulic pump, oil reservoir and hydraulic control being mounted at elevated positions above said blades with said motor and shaft being above the center of said blades and with said engine and reservoir being disposed in a balanced relation on opposite sides of said motor; and

(e) means mounted on said frame structure adapted for tilting the trowel blades in either direction about longitudinal axes and holding the blades on said support means in a selected tilted position whereby independent of the direction in which said shaft is driven the weight of said machine will be supported on and the finishing action of said blades will be accomplished by those edges of the blades which are trailing with respect to the direction of rotation of said shaft and blades.

4,320,987

CONCRETE VIBRATOR MACHINE

Murray A. Rowe, Canton, S. Dak.; Herbert C. Glesmann, Omaha, Nebr., and Ewald Ulmer, Canton, S. Dak., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Oct. 29, 1979, Ser. No. 89,170

Int. Cl.³ E01C *19/38*

U.S. Cl. 404—115 **14 Claims**

6. A concrete vibrator machine for use in conjunction with a concrete finishing machine movable longitudinally along an elongated body of concrete and having a finishing unit engageable with the surface of the concrete and movable transversely across such a body of concrete, comprising

a supporting member mounted to and extending outwardly from the finishing unit and movable therewith,

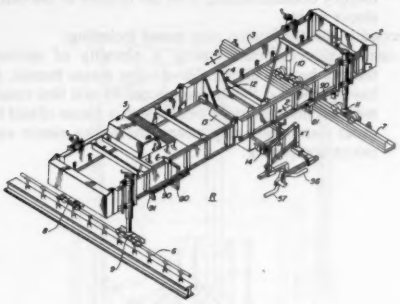
vibrator means mounted to said supporting member extending outwardly from the finishing unit and movable downwardly into and below the surface of the concrete and upwardly out of such a body of concrete and movable

with said supporting member laterally thereacross in inserted position in said body of concrete,

said supporting member including an elongated supporting frame pivotable about a substantially horizontal pivot point for raising and lowering the opposite ends of said frame,

said vibrator means comprising two vibrators mounted on respective end portions of said supporting frame and movable upwardly and downwardly therewith for lifting said vibrators from and inserting said vibrators into and below the surface of such a body of concrete,

reversing drive means operatively connected to said supporting frame for pivoting said supporting frame about said horizontal pivot point in opposite directions at respective ends of said movement of said vibrator means laterally across said body of concrete,



wherein each of said vibrators comprising an elongated, substantially L-shaped member embodying a substantially horizontally disposed leg, and another leg projecting upwardly from said first mentioned leg, and being so disposed on said supporting frame that said first mentioned leg thereof is disposed in substantially horizontally extending position along the path of travel of said vibrator during said movement thereof laterally across said body of concrete,

with said vibrators and said reversing drive means for pivoting said supporting frame being hydraulically actuated units, and

control means for feeding hydraulic fluid to said vibrators and to said reversing drive means for pivoting said vibrators.

4,320,988

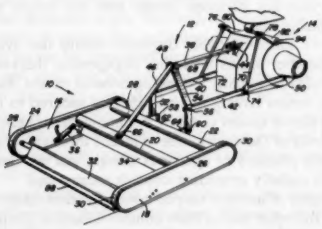
SPREADER/GRADER

James C. Seal, Rte. 1, Box 350, Picayune, Miss. 39466

Filed Aug. 26, 1980, Ser. No. 182,392

Int. Cl.³ E01C *19/22*

U.S. Cl. 404—118 **5 Claims**



4. A spreader/grader comprising a frame defined by a pair of parallel ground engaging runners rigidly interconnected by transverse frame means, a front blade mounted between said runners and being transversely continuous, a rear blade mounted between said runners and being transversely continuous, means interconnecting said blades and said runners to vary the relative position of the blades and runners and reverse the blades to enable the blades to grade, spread and transport dirt when moving in a forward or rearward direction, a tractor with a powered three-point hitch, and means on said frame connected with the three-point hitch to enable vertical manipulation of the grader/spreader for dumping dirt from the blades, elevating the frame and blades to facilitate turn around at the end of a sweep across a surface and enabling the frame to be positioned in an inclined position for grading a slope.

4,320,989

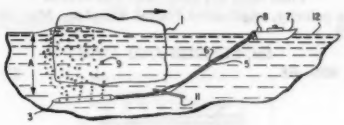
METHOD FOR MOVING ICEBERGS IN A BODY OF WATER AND RELATED APPARATUS

Anthony C. Mamo, 1515 E. Central Ave., Apt. 264-B, Arlington Heights, Ill. 60005

Filed Nov. 20, 1979, Ser. No. 95,978

Int. Cl.³ E02B *1/00, 15/02*

U.S. Cl. 405—52 **24 Claims**



1. A method for moving an iceberg in a body of water, comprising the steps of:

disposing one or more tube means which are capable of passing air through their walls below water level, in a predetermined position with respect to the floating iceberg, said position being at the section of the iceberg opposite from the direction of intended movement of the same;

connecting the tube means to a source of a gas medium under pressure;

pumping the gas medium at a predetermined pressure and volume into the tube means; and

discharging the gas medium through the walls of the tube means, and forming a wall of gas bubbles that surrounds and acts against a substantial portion of the submerged iceberg,

said portion of the iceberg being at the section thereof, opposite from the direction of intended movement of the iceberg,

said wall of gas bubbles, which bubbles seek their way upwardly to the water surface, elevating the water level around said portion of the iceberg such that the net force acting on the iceberg through the center of gravity thereof causes it to move away from the wall of gas bubbles and in the direction of intended movement of the same.

4,320,990

OIL BOOM

Peter J. R. Heasman, Hale, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 7, 1977, Ser. No. 804,374

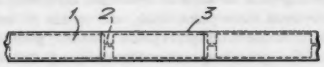
Claims priority, application United Kingdom, Jun. 25, 1976, 26512/76

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—66 **6 Claims**

1. An oil boom for containing oil spillage at the surface of a body of water comprising: a plurality of collapsible support members; means detachably stringing the support members together, said support members being capable of floating on the surface of the body of water at least when in a non-collapsed state; means to hold said support members in the non-

collapsed state; and a separate renewable sleeving of a water-resistant oil-absorbent material supported by, and removably disposed around, all of said support members and said stringing means, said sleeving being a pile-surfaced material formed by feeding a thermoplastic material and a backing to a heated



surface with the thermoplastic material between the backing and the heated surface and peeling the combination of the thermoplastic material and the backing away from the heated surface so that the thermoplastic material is drawn into fibrils or tufts to provide a pile surface.

4,320,991

INFLATABLE EQUIPMENT FOR USE AS A BOUYANT BOOM

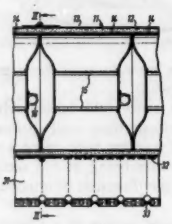
Bernard T. Rogers, Ross-Shire, Braes, Ullapool, Scotland

Filed May 29, 1979, Ser. No. 43,160

Claims priority, application United Kingdom, May 31, 1978, 25052/78

Int. Cl.³ E02B *3/00, 15/04*

U.S. Cl. 405—68 **19 Claims**



1. Elongate floatable equipment, comprising:

a plurality of discrete, independent, floatable buoyancy units; and

a sleeve comprising a net layer defining a flexible tubular casing, the net layer being made of a plurality of strands of a high tensile filamentary material, the buoyancy units being arranged into and accommodated within the sleeve, a series of circumferential hoops being defined by groups of the strands and being spaced from each other along the length of the tubular casing, the hoops being interlocked by additional strands which, together with the strands that define the hoops, are arranged as a geodetic network to limit radial expansion of the tubular casing while permitting both radial contraction of the tubular casing with proportionate increase in length of the tubular casing and radial expansion of the tubular casing to the extent allowed by the hoops with proportionate decrease in the length of the tubular casing.

4,320,992

GROUT DISTRIBUTION SYSTEM

Morris G. Baldridge; Lloyd C. Knox, and Bob L. Sullaway, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 28, 1980, Ser. No. 144,712

Int. Cl.³ E02B *17/00;* E02D *5/34*

U.S. Cl. 405—223 **2 Claims**

1. A grout distribution system comprising:

first grout distribution ring means including:

central sleeve means having a plurality of apertures therein;

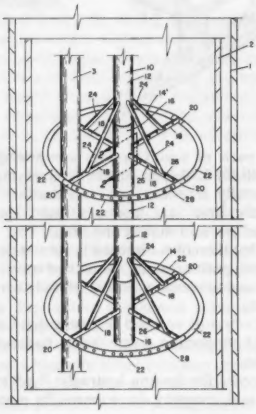
a plurality of radially extending conduit means, each conduit means having one end thereof secured to the central sleeve means to allow communication between the interior of the central sleeve means through an aperture of the plurality of apertures therein and the interior of each radially extending conduit means; and

a plurality of arcuate shaped conduit means interconnecting the other end of each conduit means of the plurality of radially extending conduit means thereby allowing communication between the interior of each of the conduit means of the plurality of radially extending conduit means and the interior of each arcuate shaped conduit means of the plurality of arcuate shaped conduit means, each arcuate shaped conduit means having a plurality of apertures therein;

first conduit means connected to one end of the central sleeve means of said first grout distribution ring means thereby communicating with the interior of the central sleeve means;

second grout distribution ring means including:

central sleeve means having a plurality of apertures therein, having sliding sleeve valve means therein, and having one end thereof connected to said first conduit means connected to the central sleeve means of said first grout distribution ring means, the sliding sleeve valve means comprising:



upper member means secured to the central sleeve means of said second grout distribution ring means;

lower member means secured to the central sleeve means of said second grout distribution ring means;

cylindrical member means having a plurality of apertures therein and having one end thereof secured to the upper member means;

end member means secured to the other end of the cyindrical member means and the lower member means; and

sleeve means slidably disposed within the cylindrical member means in sealing engagement therewith;

a plurality of radially extending conduit means, each conduit means having one end thereof secured to the central sleeve means to allow communication between the interior of the central sleeve means through an aperture of the plurality of apertures therein and the interior of each radially extending conduit means; and

a plurality of arcuate shaped conduit means interconnecting the other end of each conduit means of the plurality of radially extending conduit means thereby allowing communication between the interior of each of the conduit means of the plurality of radially extending conduit means and the interior of each arcuate shaped

conduit means of the plurality of arcuate shaped conduit means, each arcuate shaped conduit means having a plurality of apertures therein; and

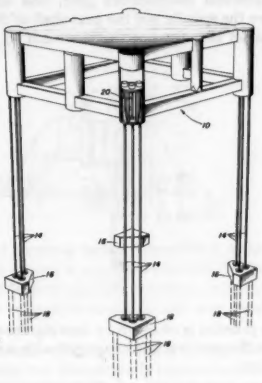
second conduit means connected to one end of the central sleeve means of said second grout distribution ring means thereby communicating with the interior of the central sleeve means.

4,320,993

TENSION LEG PLATFORM MOORING TETHER CONNECTOR

Andrew F. Hunter, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Jul. 28, 1980, Ser. No. 172,628
Int. Cl.³ B63B 21/50
U.S. Cl. 405—224 9 Claims



1. A connector apparatus for connecting a tension leg platform mooring tether to a subsea foundation, said apparatus comprising:

(a) a plug means positioned on the lower end of said mooring tether;

(b) a receptacle means positioned in said foundation, said receptacle means having a first inner diameter larger than the outer diameter of said plug and being adapted to receive said plug;

(c) a first shoulder means positioned in said receptacle means;

(d) a second shoulder means positioned in said receptacle beneath said first shoulder means;

(e) a second inner diameter section in said receptacle, said second inner diameter section being larger than said first inner diameter section and positioned beneath said first shoulder means and above said second shoulder means;

(f) a compressible load ring means positioned in a groove means in said plug, said compressible load ring having an outer diameter larger than said first inner diameter of said receptacle means and including on its lower side compression means for compressing said load ring into said groove as said load ring is passed into said first inner diameter in said receptacle means to a diameter no larger than said first inner diameter of said receptacle means, said load ring being adapted to engage said groove and said first shoulder means after passing through said first inner diameter section;

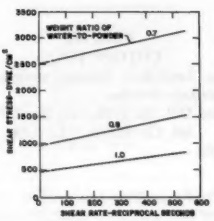
(g) a compression ring means having an outer diameter smaller than said second inner diameter section and an inner diameter substantially equal to said first inner diameter of said receptacle means, said compression ring means being slideably positioned in said second inner diameter section between said first shoulder means and said second shoulder means and adapted to compress said load ring when said plug means is lowered in said receptacle means so that as said plug means is passed into said receptacle means said load ring is compressed until said load ring has passed through said first inner diameter section of said receptacle means, with said load ring then returning to its uncompressed diameter and engaging said first shoulder means and said groove means and retaining said plug means in said receptacle means with said load ring being compressible by said compression ring upon lowering said plug means further in said second inner diameter in said receptacle means thus passing said load ring means into compressing engagement with said compression ring means which is urged into compressing engagement with said load ring by contact with said second shoulder means.

4,320,994

PREPARATION OF GROUT FOR STABILIZATION OF ABANDONED IN-SITU OIL SHALE RETORTS

Richard G. Mallon, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,364
Int. Cl.³ E21C 41/10
U.S. Cl. 405—267 10 Claims



10. A method for stabilizing an abandoned, processed in-situ oil shale retort using oil shale which has been removed from the retort in the preparation process, comprising:

surface retorting the oil shale removed from the in-situ retort, thereby producing oil shale and leaving spent shale containing carbon;

burning off substantially all the carbon from the spent shale, leaving burned shale;

treating the burned shale in steam at approximately 700° C. for approximately 70 minutes to produce treated shale with a high composition of the strength materials alite and larnite;

grinding the treated shale into powder;

mixing the powder with water in a ratio of water to powder of approximately 0.8 by weight to produce a grout; and

injecting the grout into the abandoned, processed in-situ retort to fill void spaces and solidify into a rigid mass.

4,320,995

VACUUM-OPERATED PRODUCE HANDLING SYSTEMS

Bernard R. Tennes, Charlotte; Richard J. Wolthuis, Haslett, and Clyde L. Burton, East Lansing, all of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 21, 1980, Ser. No. 132,583
Int. Cl.³ B65G 53/30, 53/40
U.S. Cl. 406—39 4 Claims

1. An apparatus for handling freshly harvested produce comprising:

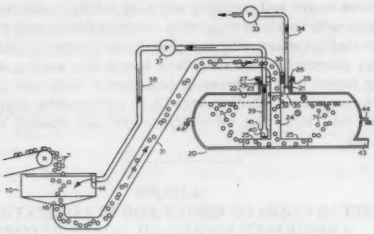
a. a flume hopper having an opening in the top for receiving said produce, a liquid stream inlet,

a baffle means for dividing said liquid stream into countercurrent portions and for causing aeration of said liquid, an

outlet for said liquid and said produce, and at least one downwardly sloping bottom portion for directing said produce suspended in said liquid into said outlet;

b. a sealable holding tank for said liquid and said produce;

c. a suction line for conveying said suspended produce into said holding tank;



d. means for recirculating said liquid from said holding tank to said flume hopper; and

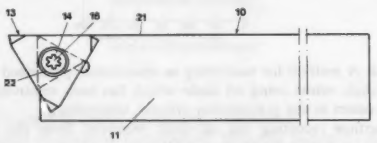
e. means for applying a sufficient vacuum to said holding tank for drawing said suspended produce from said flume hopper outlet through said suction line and into said holding tank.

4,320,996

CUTOFF TOOL

Axel S. O. Roos, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Oct. 16, 1980, Ser. No. 197,610
Int. Cl.³ B26D *1/12, 1/00*
U.S. Cl. 407—103 **4 Claims**



1. Cutting tool for grooving and cutoff operations, comprising a tool holder (10), said holder having a top face, a bottom, two opposed longitudinally extending side faces generally parallel to each other, a front and a back, said tool holder being provided at one of its side faces with a recess (12) confined by a base support surface (17) and at side support surfaces (18, 19) upstanding therefrom, a cutting insert (13) releasably secured into said recess (12) by means of a centre screw (14) threadably engageable with a transverse bore (15) in the holder (10), characterized in, that the insert (13) is in the shape of a polygon, the central portion of which being a protrusion (20) extending from the remainder of the insert whilst being received in said recess (12), which recess is complementarily shaped with regard to said protrusion (20), said protrusion having same polygonal shape as said insert but being angularly offset therefrom.

4,320,997

SPINDLE HOLDER GUIDE MEMBER FOR MULTIPLE SPINDLE ATTACHMENT

Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Company, Limited, Gifu, Japan

Filed Mar. 3, 1980, Ser. No. 126,745
Claims priority, application Japan, Dec. 21, 1979, 54-167094
Int. Cl.³ B23B *39/20*
U.S. Cl. 408—46 **7 Claims**

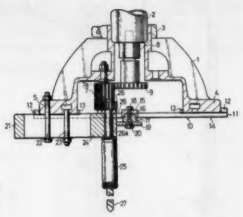
4. A multiple spindle head having a system to easily and precisely adjust the position of spindles located inside the spindle head comprising,

a spindle frame having a clamping member at one side for detachably connecting the spindle frame to a quill of a drilling machine, and a spindle flange at the opposite side of the clamping member,

a main gear rotationally situated in the center of the spindle frame, said main gear being connected to a main shaft of the drilling machine for rotation thereof,

a plurality of intermediate gears in the spindle frame situated around the main gear to mesh therewith, said intermediate gears having gear shafts to move around the main gear to change relative positions in the frame,

a plurality of spindle members, each having a spindle holder detachably and movably connected to said spindle flange, a spindle rotationally supported in said spindle holder, a spindle gear connected to said spindle to mesh with said predetermined intermediate gear, and an arm situated between the spindle and the gear shaft of the intermediate gear to set the distance therebetween so that when the



spindle position is changed by moving the spindle holder, the spindle gear is always engaged with said intermediate gear, and

a guide member for the spindle holders detachably connected to said spindle frame, said guide member including a guide member body having means to locate the body in the center of the spindle frame when the body is attached thereto, a plurality of guide channels formed in said guide body, said guide channels radially outwardly extending substantially from the center of said guide member body directly into communication with the exterior of the guide member body, each guide channel having the same width as that of the spindle holder so that the spindle holder can be moved along the guide channel, and a positioning member attached to the center of the exterior of said guide member body, said positioning member being interchangable with at least one other like positioning member of a different size, whereby when the spindle holders in the guide channels are moved to abut the positioning member, the spindle holders are set equally away from the center of the spindle head.

4,320,998

DEBURRING TOOL

Louis A. Kubicek, 2124 Lake View, Ypsilanti, Mich. 48197

Filed May 8, 1980, Ser. No. 147,568
Int. Cl.³ B23B *51/16*
U.S. Cl. 408—226 **6 Claims**

1. A tool for removing burrs formed on the edge of drilled holes, said tool comprising:

a first and second elongated arm member, each arm member having an arcuate cutting lobe formed on one axial end;

a support member including a collet; and

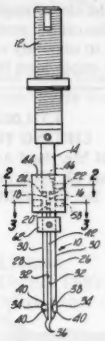
means for detachably securing each other axial end of each arm member to said support member within said collet, whereby said arm members are spaced from but substantially parallel to each other so that said cutting lobes are positioned on the outer periphery of each arm member.

4. In combination with a tool holder including an outwardly

extending tool holding rod, a tool for removing burrs formed on the edge of drilled holes, said tool comprising:

a first and second elongated arm member, each arm member having an arcuate cutting lobe formed on one axial end;

means for detachably securing arm members to the outwardly extending end of the tool holding rod so that said arm members are spaced from and substantially parallel to each other and so that the cutting lobes are positioned on the outer periphery of each arm member;



wherein said securing means comprises a support member positioned around a portion of said tool holding rod and a portion of both of said arm members, said support having means for releasably clamping said arm members to said tool holding rod; and

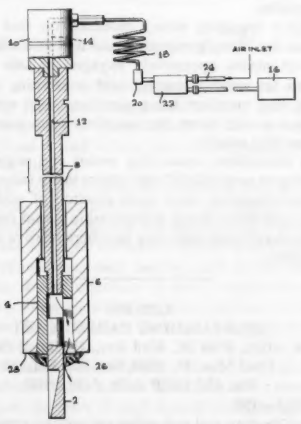
wherein the outwardly extending end of said tool holding rod includes two diametrically opposed axial flats, each of said arm members adapted to abut against one of said axial flats.

4,320,999

COOLANT GUIDE FOR END MILL

Leonard A. Briese, 5039 Browndeer La., Rancho Palos Verdes, Calif. 90274

Filed Mar. 13, 1980, Ser. No. 129,995
Int. Cl.³ B23C 9/00
U.S. Cl. 409—136 **5 Claims**



1. A coolant flow guide system for end mills having flutes and used on a milling machine employing a collet and a machine spindle combination to retain the end mill in an operating position, said coolant flow guide system including:

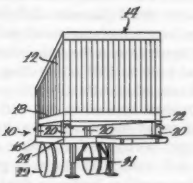
collar means for receiving coolant and draining said coolant down to the flutes of an end mill, said collar means having a central aperture and a concave shape including a concave surface, said central aperture being round and having one or more grooves in walls thereof, said concave surface of said collar means having a plurality of spiral sections extending from said central aperture to the periphery of said concave surface for urging coolant contained therein towards said central aperture when said collar means is rotated with an end mill on which it is mounted, said collar means being operatively mounted on an end mill by having the end mill extend through said central aperture with said concave surface situated to receive coolant and said grooves aligned to permit coolant received by said concave surface to drain to said flutes.

4,321,000

CONTAINER REPAIR SPACER SYSTEM

John Novak, 8830 Fairway Dr., Orland Park, Ill. 60462

Filed Apr. 25, 1980, Ser. No. 143,540
Int. Cl.³ B60S 9/22; B60P 7/13
U.S. Cl. 410—76 **33 Claims**



1. A system for spacing and holding a container of a truck above its chassis to facilitate servicing and repair of the container, comprising:

a chassis for removably carrying and supporting said container, said chassis having a plurality of chassis twist locks;

a container having a frame defining a plurality of frame-engaging twist lock-receiving openings, each frame-engaging twist lock-receiving opening having a length greater than its width; and

a plurality of container repair spacer assemblies for spacing said container above said chassis, at least one of said container repair spacer assemblies having

a base defining a chassis twist lock-receiving opening for removably receiving and interlockingly engaging one of said chassis twist locks to detachably secure said container repair spacer assembly to said chassis,

a frame-engaging twist lock insertable into one of said frame-engaging twist lock-receiving openings of said container frame, said frame-engaging twist lock having elongated side walls spanning a length greater than the width of said frame-engaging twist lock-receiving opening of said container frame but less than the length of said frame-engaging twist lock-receiving opening,

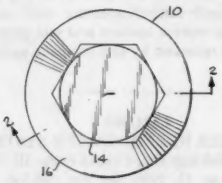
a collar positioned about each said frame-engaging twist lock for abuttingly engaging and supporting said container frame,

wall means extending between and connecting said collar and said base, and

control means for moving said frame-engaging twist lock between (1) an insertion and removal position wherein said elongated side walls are positioned in the same general direction as the length of said twist lock-receiving opening in said frame for permitting insertion and removal of said frame-engaging twist lock of said container repair spacer assembly relative to said frame-engaging twist lock-receiving opening of said container frame and (2) a locking position wherein said elongated side walls are

positioned generally transverse to the length of said frame-engaging twist lock-receiving opening in said frame for locking said frame-engaging twist lock to said container frame.

4,321,001
FABRICATED INDUSTRIAL FASTENER
Peter Gruich, 31432 Schoenberr, Apt. #5, Warren, Mich. 48093
Filed Jun. 19, 1980, Ser. No. 161,187
Int. Cl.³ F16B *35/00*
U.S. Cl. 411—396 **4 Claims**

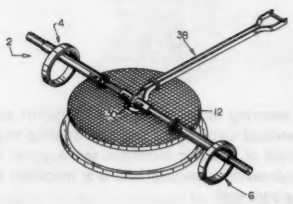


1. A bolt having a washer incorporated into its head, comprising a first member that includes a first circular shank portion (**10**) of relatively small diameter defining the bolt axis, a second noncircular wrench-engagement portion (**14**) of relatively large major dimension in the radial direction, and a third tapered transitional portion (**30**) connecting the first and second portions; said second and third portions being formed by an upset forging process applied to one end of the shank portion; and a second collar member (**9**) having interior surface areas thereof engaged with exterior surface areas of the circular shank portion and transitional tapered portion of the first member; said collar member having a first flat radial work-engagement surface (**18**), a second radial surface parallel to said first surface, and a hole extending therebetween; said hole defining an interior cylindrical surface conforming to the surface contour of the aforementioned shank portion and a frustoconical interior surface conforming to the surface of the aforementioned tapered transitional portion; the aforementioned first flat radial work-engagement surface having a major diameter substantially greater than the major radial dimension of the non-circular wrench-engagement portion whereby said first flat radial surface can have a substantial area of engagement with the work; and a weld connection between the collar member interior surfaces and the engaged exterior surface areas of the first member; the first flat radial surface on the collar member terminating at the shank portion of the first member at a ninety degree angle without fillet radius.

4,321,002
MEDICAL STAPLING DEVICE
Harold E. Froehlich, St. Anthony, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 890,682, Mar. 27, 1978, Pat. No. 4,185,762.
This application Sep. 24, 1979, Ser. No. 78,602
Int. Cl.³ F15B *15/00*; A43B *23/20*
U.S. Cl. 411—457 **2 Claims**

1. An open wire staple for suturing living tissue, said open staple comprising a generally U-shaped central portion having at least one arcuate part; and outer portions terminating in sharp points, said outer portions being smoothly curved from said sharp points to adjacent said central portion with successive parts of said curved outer portions starting from adjacent said central portion being at increasingly greater distances from the adjacent arcuate part of said central portion, said staple is closed by bending generally straight the arcuate part of said central portion adjacent each of said curved outer portions so that said curved outer portions can smoothly enter and gather living tissue, during such closure the sharp points on the outer portions will move to positions with their sharp points adjacent and generally aligned with each other to provide a generally D-shaped closed staple with the maximum inside dimension of the closed staple generally parallel to said central portion, and the central portion of the closed staple can subsequently be bent to smoothly retract the smoothly curved outer portions of the staple from the living tissue.

4,321,003
LIFTING TOOL
Alfred B. Castle, 4104 Maryland Ave., Bethesda, Md. 20016
Filed Mar. 19, 1980, Ser. No. 131,690
Int. Cl.³ B62B *1/14*
U.S. Cl. 414—440 **10 Claims**



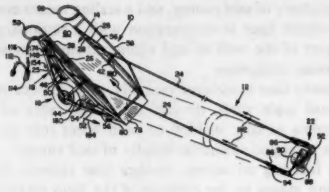
1. A tool for vertically lifting and maneuvering objects, comprising:
   (a) ring support means for supporting said tool during lifting and maneuvering of an object, said ring support means having at least two axially spaced-apart ring assemblies defining an object receiving zone between said assemblies, each ring assembly including an inner and outer concentric ring member each independently rotatable with respect to the other, said inner ring member being at least partially axially within said outer ring member;
   (b) connecting means mounted on said inner ring members for axially connecting together said spaced-apart ring assemblies;
   (c) object engaging means mounted on said connecting means for liftingly engaging said tool and said object;
   (d) lever means operatively engaged to said connecting means for axially rotating said connecting means, said inner ring members being simultaneously rotatable with respect to said outer ring members upon rotation of said connecting means;

said ring assemblies, connecting means and engaging means cooperating to vertically lift said object into a raised position in said object receiving zone upon rotation of said inner ring members, said object being transportable in said raised position upon rotation of said outer ring members relative to said inner ring members.

4,321,004
SELF-LOADING CARPET CART
Thomas V. Mills, 6704 SE. 83rd Ave., Portland, Oreg. 97266
Filed Mar. 17, 1980, Ser. No. 131,215
Int. Cl.³ B60P *1/04, 1/38, 3/00*
U.S. Cl. 414—490 **12 Claims**

1. A self-loading and unloading carpet cart comprising:
   a tiltable, wheeled frame;
   conveyor means supported on said frame for moving a carpet roll lengthwise along a conveyor path;

winch means for winching said carpet roll lengthwise onto said conveyor means; and



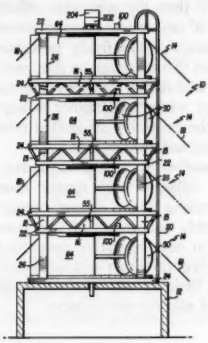
drive means for driving said winch means and said conveyor means together for cooperatively loading said carpet roll onto the cart.

4,321,005

MODULAR WINDMILL INSTALLATION

Jerimiah B. Black, 2065 Church Creek Dr., Charleston, S.C. 29407

Filed Jan. 3, 1980, Ser. No. 109,258
Int. Cl.³ F03D 7/06
U.S. Cl. 415—4 14 Claims



1. A windmill installation comprising:

a base;

a plurality of wind wheel modules mounted on said base in vertically stacked relation, each module having a wind rotor comprising a hollow shaft and at least one rotor blade affixed to said hollow shaft for producing rotation of said wind rotor;

a drive shaft for delivering the rotational output of all the wind rotors to a utilization device; said drive shaft extending substantially coaxially through said hollow shaft;

clutch means arranged within the hollow shaft of each rotor for interconnecting such hollow shaft to the drive shaft such that in one direction of rotor rotation the rotor is positively engaged with the drive shaft and in the other direction of rotor rotation the rotor is disengaged from the drive shaft; and

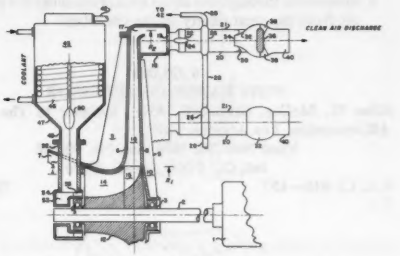
brake means associated with the rotor of each module and engageable with the hollow shaft thereof for stopping the rotation of the rotor of such module independently of the rotors of the other modules, whereby the rotor of one module is adapted to be stopped from rotation without stopping the rotation of the rotors of the other modules.

4,321,006

GAS COMPRESSION CYCLE AND APPARATUS THEREFOR

Hans J. P. von Ohain, 5598 Folkestone Dr., Dayton, Ohio 45459; Frank L. Wattendorf, 3005 P St., NW., Washington, D.C. 20007, and Maurice O. Lawson, 7006 Cedar Pines Ct., Dayton, Ohio 45459

Filed Mar. 5, 1980, Ser. No. 127,491
Int. Cl.³ F04B 39/06
U.S. Cl. 415—115 8 Claims



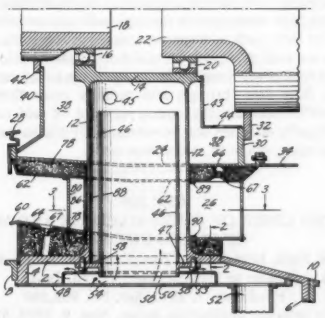
1. In a gas compression system a centrifugal compressor having a vaned rotor therein adapted to centrifugally accelerate a gas stream therein and to discharge the gas stream therefrom, means in said rotor for centrifugally accelerating a stream of dense small particles and discharging the same to comingle with the gas stream, a radial vane free diffuser having an inlet and an outlet with the inlet adapted to receive the gas and particle streams to form a composite flow for kinetic energy transfer from the particles to the gas stream and heat energy from the gas stream to the particles and means connected to the outlet of the diffuser for separating the particles from the composite flow to leave a clean high pressure gas stream.

4,321,007

OUTER CASE COOLING FOR A TURBINE INTERMEDIATE CASE

William T. Dennison, East Hartford, and David K. Jan, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,414
Int. Cl.³ F01D 25/16
U.S. Cl. 415—142 6 Claims



1. A turbine bearing support including:

an outer case element;

an inner case element within and spaced from the outer case element;

a plurality of hollow radial struts secured to and extending inwardly from the outer case element and through the

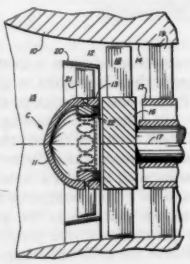
inner case element and having a plurality of vent holes near the inner end;
a bearing support secured to and supported by the inner ends of said struts;
a seal and diaphragm means carried by the inner case element and forming a vent cavity within the inner case communicating through the vent holes of the hollow strut;
a chamber external of the outer case element and having a plurality of impingement holes in the wall thereof for directing air against the outer case element; and
a connection through the struts to said chamber for directing air from the vent cavity to the chamber.

4,321,008

WIDE RANGE COMPRESSOR

Allan W. McCoy, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 16, 1979, Ser. No. 95,706
Int. Cl.³ F04D *29/46, 29/56*
U.S. Cl. 415—157 **26 Claims**



1. A wide range compressor comprising:
(a) casing means defining a fluid flow passage having an axis, an inlet, and an outlet spaced apart from said inlet along said axis;
(b) rotor means positioned in said passage for inducing fluid flow into said inlet, along said passage and across said rotor means, and out said outlet; and
(c) compressor outlet pressure and stall control means positioned in said passage upstream of said rotor means, and defining along an axial portion of said passage a selectively variable, radially inner flow path and a nonvariable radially outer flow path axially coextensive therewith, for inhibiting stall of said compressor by facilitating backflow from said rotor means through said nonvariable radially outer flow path in response to a reduction in the flow rate across said rotor mean, said compressor outlet pressure and stall control means being operable to selectively vary the flow rate through said radially inner flow path to thereby maintain the outlet pressure of said compressor generally constant across substantially the entire flow rate operating range of said compressor.

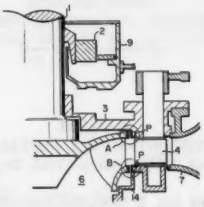
4,321,009

RUNNER LINER OF FLUID MACHINE AND METHOD OF FIXING THE SAME

Tsuyoshi Fujii, Hitachi, and Isao Yanagida, Juomachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1978, Ser. No. 958,389
Claims priority, application Japan, Nov. 9, 1977, 52-133431
Int. Cl.³ F03B *3/10*; F01D *11/08*
U.S. Cl. 415—172 R **8 Claims**

1. A runner liner in combination as a part of a fluid machine having a stationary runner chamber, a runner rotatably mounted in said runner chamber in an operative assembled relationship, a main shaft attached to said runner, a bearing for supporting said main shaft, a fluid passage through which a working fluid is introduced into said running chamber, another fluid passage through which said working fluid is discharged out of said runner chamber, at least one runner liner attached to the periphery of said runner, and a sealing means constituted by said runner liner in cooperation with a stationary sealing surface part of the wall of said runner chamber, wherein the improvement comprises:
said runner liner is circumferentially, with respect to the axis of said main shaft, divided into a plurality of arcuate segments serially welded to each other into an annular form arranged circumferentially of said runner;
means forming an access passage that extends from said sealing means to the exterior of the fluid machine when said runner chamber and runner are in the operative assembled relationship;



each of said segments having an effective three-dimensional shape smaller than the minimum effective three-dimensional shape of said access passage means;
said access passage means freely permitting movement of each segments therethrough so that each segment can be brought into said runner chamber from the exterior of said fluid machine while said runner is kept in said runner chamber in the operative assembled relationship without disassembly of said runner; and
said runner chamber including workman chamber means immediately adjacent said runner liner for providing workman working access to said runner liner for assembly, disassembly and repair of said runner segments on said runner in said operative assembled relationship; a removable cover covering said workman chamber means and partially forming said stationary sealing surface part of the wall of said runner chamber.

4,321,010

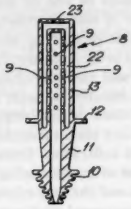
AEROFOIL MEMBER FOR A GAS TURBINE ENGINE

Wilfred H. Wilkinson, Turnditch; Edwin Pateman, Allestree; Anthony G. Gale, Wollaton, and John Slinger, Spondon, all of England, assignors to Rolls-Royce Limited, London, England

Filed Jul. 31, 1979, Ser. No. 62,419
Claims priority, application United Kingdom, Aug. 17, 1978, 33660/78
Int. Cl.³ F01D *5/18*
U.S. Cl. 416—92 **5 Claims**

1. A unitary cast vane or blade structure for a gas turbine engine comprising:
a hollow aerofoil member having an inner end and an outer end; and
a cooling air entry tube having an inner end and an outer end, said cooling air entry tube having its inner end integral with the inner end of said hollow aerofoil member, said cooling air entry tube extending from the inner end toward the outer end of said hollow aerofoil member in cantilever relationship within and spaced entirely from an interior surface of said hollow aerofoil member whereby

said unitary cast structure of said hollow aerofoil member and said cooling air entry tube has a reduced overall



weight and said aerofoil member is provided with increased freedom of aerodynamic design.

4,321,011

FAN ASSEMBLY

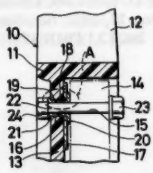
Takanobu Hori, Toyota, and Motoharu Yoshida, Ichinomiya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1979, Ser. No. 94,566

Claims priority, application Japan, Nov. 23, 1978, 53-145068; Apr. 7, 1979, 54-042132

Int. Cl.³ F04D *29/34*

U.S. Cl. 416—214 R **15 Claims**



1. A fan assembly driven by an output member of an internal combustion engine of an automotive vehicle comprising:

a hub portion formed of molded plastic;

a plurality of blades extending radially outwardly from said hub portion;

a stem projecting radially inwardly from said hub portion and including a plurality of axial holes formed therein, said blades and said stem being integral with said hub portion;

a plurality of bushings inserted in said holes, each of said bushings including a flange formed at one end thereof interposed between one side of said stem and said output member, a caulked portion at the other end thereof rigidly connected to the other side of said stem and a knurled portion on an outer surface thereof for securing said stem thereto;

a plurality of bolts passing through said output member and said bushings for securing said hub portion to said output member; and

a spacer having a plurality of axial holes formed therein, said spacer being interposed between said flange of said bushings and one side of said stem and said bolts being mounted within said holes of said spacer wherein said spacer and each of said bushings are fixedly connected to each other, and wherein said bushings are provided with a non-knurled portion on the outer surface between said knurled portion and said flange, and said non-knurled portion rigidly connected to said spacer.

4,321,012

TURBINE BLADE FASTENING CONSTRUCTION

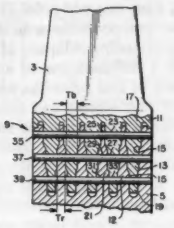
Toshimi Tan, and Katsukuni Hisano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,365

Claims priority, application Japan, Dec. 20, 1978, 53-156429

Int. Cl.³ F01D *5/32*

U.S. Cl. 416—217 **4 Claims**



1. A construction for fastening a moving blade to a rotor wheel of a turbine comprising:

a plurality of rotor wheel projections axially and outward from the periphery of said rotor wheel, said plurality of rotor wheel projections defining spaces between adjacent projections and having thickness between said spaces;

at least a moving blade projection provided in the root portion of said moving blade, having a shape similar to said space and thickness, and inserted in one of said spaces,

at least two supporting portions provided on each of said rotor wheel projections and moving blade projection, and axially spaced from each other for fastening said moving blade to said rotor wheel, the projections of one of said blade and rotor being larger in Young's modulus and being thinner in thickness than the projections of the other of said blade and rotor, wherein said moving blade projection has average thickness obtained by multiplying the average thickness of said rotor wheel projections by a ratio of Young's modulus of said rotor wheel to Young's modulus of said moving blade.

4,321,013

HEADPIECE SUPPORT FOR ROTOR OF A ROTARY WING AIRCRAFT

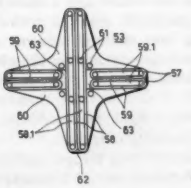
Alois Schwarz, Putzbrunn, and Karlheinz Mautz, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Apr. 22, 1980, Ser. No. 142,848

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916727

Int. Cl.³ B64C *11/06*

U.S. Cl. 416—244 R **15 Claims**



1. In a rotor for a rotary wing aircraft having a central headpiece having radially outwardly extending blade supports for supporting rotor blades, said central headpiece comprising an integral body of composite fiber material, said body com-

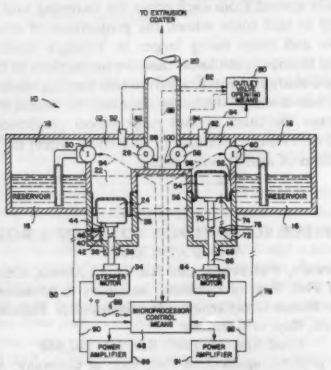
prising a pair of similarly shaped oppositely arranged star-shaped plates spaced from one another, and at least one distance member extending between and interconnecting said plates, said central headpiece arranged to support an even number of at least four rotor blades with said blades arranged in diametrically opposed pairs, said plate having a point-like arm corresponding to each of the blades supported thereon, wherein the improvement comprises that each plate includes a plurality of layers, each said layer comprising at least one first fiber loop extending from one said point-like arm into another diametrically opposed said point-like arm, and at least a second and a third fiber loop extending obliquely of said first fiber loop and each located in a different one of said point-like arms extending transversely of said point-like arms containing said first fiber loop, each said second and third loops extending through said point-like arm in which the second or third loop is located and extending from adjacent said first loop generally radially outwardly through said point-like arm relative to the center of said layer so that said second and third loops are separated by said first loop, in each adjacent pair of said layers said first loop in the one of said layers extends in the same direction of at least the one said second and third loops in the other said layer, and an intermediate layer inegrally connecting adjacent said layers containing said loops.

4,321,014

CONSTANT FLOW PUMPING APPARATUS

William H. Eburn, Jr., Sudbury, Mass., and Stephen P. Kalenik, Merrimack, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1979, Ser. No. 108,700
Int. Cl.³ F04B *41/06*
U.S. Cl. 417—5 **12 Claims**



1. A pump comprising:

first and second pumping chambers, each of said chambers having an inlet, an outlet and a movable member for pressurizing a pumpable material within said chambers and for moving said material between an inlet and an outlet of their associated pumping chamber;

means for generating a signal representative of selected positions of each of said movable chamber members;

means for generating a signal representative of the pressure in each of said pumping chambers;

energizable first and second stepper motors, each of said motors having members that are rotatable in equal angular increments;

means for coupling said rotary motion of said first stepper motor to said movable first chamber member and for coupling said rotary motion of said second stepper motor to said movable second chamber member, each of said coupling means having the same mechanical advantage between their respective stepper motor and movable chamber member;

means responsive to said chamber pressure signal for interconnecting the outlet of one of said chambers with the outlet of the other of said chambers in a communicating relationship without displacing said pumpable material when the pressures in each of said chambers are equal; and

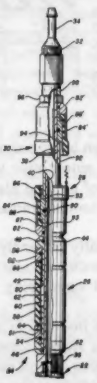
means responsive to said movable chamber member position signal and to said chamber pressure signal for varying the rotational rate of each of said stepper motors such that incremental steps are simultaneously added to said first stepper motor and subtracted from said second stepper motor until the rate of rotation of said first stepper motor is reduced to zero and the rate of rotation of said second stepper motor is increased to the rotational rate of said first stepper motor immediately prior to the said simultaneous variation of the rates of rotation of said stepper motors, for selectively connecting said inlets of said pumping chambers to a source of pumpable material for subsequent movement of said material into a selected pumping chamber, for isolating said selected pumping chamber from said source of pumpable material after sufficient material has been moved into said selected pumping chamber by said movable chamber member, and for terminating the movement of said movable chamber member when the pressure in each of said pumping chambers are equal.

4,321,015

DOWNHOLE, HYDRAULICALLY ACTUATED PUMP ASSEMBLY WITH PRESSURE SETTABLE PACKER NOSE ASSEMBLY

George K. Roeder, P.O. Box 1435, Odessa, Tex. 70760

Filed Dec. 17, 1979, Ser. No. 104,261
Int. Cl.³ F04B *47/12*
U.S. Cl. 417—56 **9 Claims**



1. In a free-type hydraulically, actuated downhole pump assembly which can be circulated into and out of a power oil tubing string, the combination with said downhole pump of a packer nose assembly;

said packer nose assembly includes a hollow central mandrel having one end adapted to be attached to the upper end of a pump assembly;

a packer device telescopingly received about said mandrel, said packer device comprises upper and lower end members having an enlarged head thereof from which there extends a skirt member;

seal means between said end members and said mandrel with one of said end members being slidably received in a reciprocating manner upon said mandrel;

said enlarged head of said end members each being opposed

to one another, and each said skirt member being located adjacent to one another;

a cylindrical packer rubber having a medial body portion and opposed marginal end portions;

a mount member slidably received about each said skirt member, seal means positioned between each said mount means and the exterior of said skirt, a circumferentially extending shoulder arranged to form an annular cavity between each skirt member and mount member within which the marginal ends of the packer rubber is received in captured relationship therewith;

a seal cup device; said seal cup device and said packer device being axially aligned respective to one another, said seal cup device having a circumferentially extending sealing element which upwardly opens so that downward flow of fluid through the tubing string forces the sealing element to expand into engagement with the interior of the tubing string;

said seal cup device being slidably received upon said mandrel and abuttingly engaging said head of said upper end member so that as the seal cup device is forced in a downward direction, the packer rubber is compressed between the opposed heads, thereby forcing the packer rubber to expand outwardly into engagement with the interior of the tubing string.

4,321,016

APPARATUS FOR CONTINUOUS SLURRY DISPLACEMENT TRANSFER

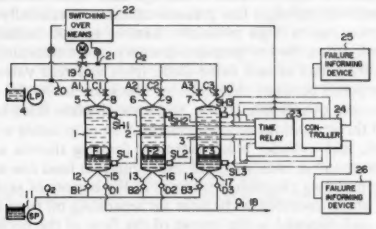
Masakatsu Sakamoto, Matsudo, and Kenji Uchida, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,721

Claims priority, application Japan, Apr. 4, 1979, 54-39823

Int. Cl.³ F04B *21/00*; F04F *11/00*

U.S. Cl. 417—63 **7 Claims**



1. An apparatus for continuous slurry displacement transfer comprising a plurality of vessels arranged in parallel, driving liquid inlet and outlet pipes each having a valve therein and connected to the top portion of each vessel, slurry inlet and outlet pipes each having a valve therein and connected to the bottom portion of each vessel, float members each disposed in each vessel, detectors provided outside of said vessels for detecting said float members coming to their upper and lower limit positions in said vessels, and controller means to which said detectors are connected; characterized by failure informing means connected to said controller means, said controller means being adapted to calculate the time periods of time taken by said float members in each vessel moving between the levels of both upper and lower limit position detectors, said failure informing means being responsive to said controller means for indicating or informing the operator of any failure taking place in said apparatus when the calculated period of time of movement of said float members calculated by said controller means has become longer or shorter than a predetermined period of time.

4,321,017

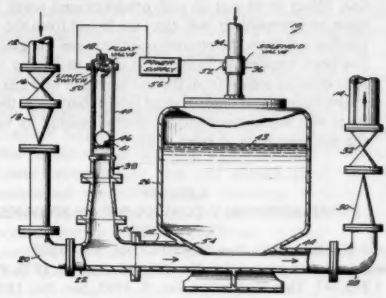
PNEUMATIC EJECTOR CONTROL

Mayo Gottliebson, 419 E. Main St., Lancaster, Ohio 43130

Filed Mar. 12, 1980, Ser. No. 129,822

Int. Cl.³ F04F *1/06*

U.S. Cl. 417—128 **3 Claims**



1. In combination with a pneumatic ejector pot incorporates at its lower end a liquid transport conduit system between an upstream inlet conduit means incorporating and served by an upstream anti-backflow check valve, and a downstream outlet conduit means incorporating and served by a downstream anti-backflow check valve, and in which the ejector pot is served by a compressed air inlet line for connection with a compressed air supply for internally pressurizing the ejector pot to forcibly empty liquid therefrom downstream in said liquid transport conduit system,

a control means for automatically selectively alternately supplying and terminating the supply of compressed air to the pot via said compressed air inlet line for cycling the pneumatic ejector pot between a filling phase thereof in which liquid runs into the ejector pot via the upstream inlet conduit and an emptying phase during which liquid which has filled the ejector pot to a predetermined level is forced out of the ejector pot and downstream through the downstream outlet conduit,

said control means comprising:

a control standpipe based on said upstream inlet conduit means and having an internal chamber in communication with said inlet conduit means at the base of said control standpipe to provide a control column having a lower end corresponding with the lower end of the ejector pot and an upper end corresponding with said predetermined level, up to which the ejector pot is to become filled with liquid when it is to be considered as full;

a vent in said control standpipe above said upper end of said control column;

valve means for opening and closing said vent, said valve means including a liquid level sensing-type valve actuator for maintaining said valve means in a vent closing condition only when said control column is filled with liquid to a filling level corresponding to said predetermined level;

a remotely-operable valve incorporated in and serving said compressed air inlet line of said ejector pot;

said compressed air inlet line further including a pot vent; and

said remotely operable valve being movable between one position, wherein the ejector pot is connected to said pot vent but disconnected from its compressed air supply and another position, wherein the ejector pot is disconnected from said pot vent but connected with said compressed air supply;

a limit switch operatively connected with said liquid level sensing-type valve actuator for providing a control signal equating with said control column being liquid-filled up to said filling level;

and operative connection means, including power means, connecting said limit switch with said remotely operable valve for placing said remotely operable valve in said other position only when said control column is filled up to said filling level thereof, so that, in operation:

the control column and ejector pot will fill with liquid together at equivalent levels until each is full respectively to said filling level and to said predetemined level, whereupon compressed air will eject the liquid from the ejector pot but not from the control column, until the ejector pot has been emptied sufficiently to open an airway via said inlet conduit means from the lower end of said ejector pot to the base of said control standpipe, whereupon the liquid level will fall in the control column causing its vent and the pot vent both to open again.

4,321,018

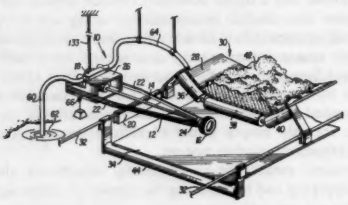
PUMP ASSEMBLY DRIVEN BY AN ENDLESS CONVEYER

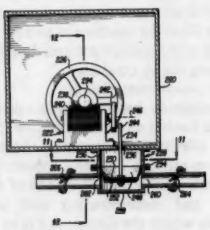
Frank K. Hurt, P.O. Box 818, Bluefield, Va. 24605

Continuation-in-part of Ser. No. 898,062, Apr. 20, 1978, Pat. No. 4,213,743. This application Jan. 8, 1980, Ser. No. 110,519

Int. Cl.³ F04B *9/02, 17/00;* **F16H** *13/10;* **B65G** *21/00*

U.S. Cl. 417—229 **25 Claims**





1. A liquid pump assembly to be mounted on a rope-like member of an endless conveyer support, for engaging an endless conveyor to be thereby powered, said rope-like member being positioned adjacent to and extending parallel with, the endless conveyer, the endless conveyer having conveying and return portions, said liquid pump assembly comprising:

an elongated frame;

a shaft journaled for rotation in said frame and extending longitudinally along said frame;

a drive wheel attached to and rotatable with said shaft;

a liquid pump mounted on said frame at a position spaced from said drive wheel, said pump defining a liquid inlet and outlet, said pump having an impeller means movably linked to said shaft for moving in response to rotation of said shaft for creating a pressure differential between said inlet and outlet; and

a mounting means attached to said elongated frame for mounting said elongated frame on said rope-like member running parallel to said endless conveyor for allowing movement of said drive wheel toward contact with said endless conveyer to be thereby driven by said endless conveyer.

4,321,019

SWASH PLATE TYPE COMPRESSOR

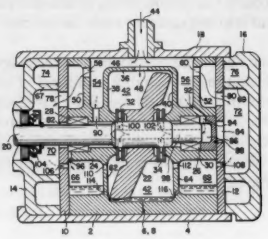
Takashi Degawa; Atsushi Suginuma, both of Mito; Hideo Usui, Katsuta; Kenichi Kawashima, Hitachi; Tsuneo Kan, and Kunihiko Takao, both of Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 31, 1979, Ser. No. 44,216

Claims priority, application Japan, Jun. 2, 1978, 53/65746; Jun. 14, 1978, 53/70882

Int. Cl.³ F04B *1/16*

U.S. Cl. 417—269 **8 Claims**



1. A swash plate type compressor comprising a cylindrical compressor housing having an inlet for coolant gas, a cylinder block assembly supported within said compressor housing, a drive shaft rotatably supported by radial bearings at its ends in said cylinder block assembly and having an oil passage therein opening at one end to the rear end thereof and at the other end to thrust bearings, front and rear side covers disposed at opposite ends of said cylinder block assembly, said side covers disposed at opposite ends of said cylinder block assembly, said side covers having a low pressure chamber at a radially central portion and a high pressure chamber spaced radially outwardly from the low pressure chamber, seal means disposed at the front end of said drive shaft, front and rear valve plates interposed between said cylinder block assembly and respective ones of said side covers, and a swash plate fitted between said thrust bearings on said drive shaft so as to rotate with said shaft, said cylinder block assembly forming therein a swash plate chamber enclosing said swash plate; at least one main oil accumulating chamber positioned at the bottom of said cylinder block assembly, a chamber for separating oil from coolant gas and disposed in the course of the flow of the coolant gas from the inlet to the low pressure chamber, and a residual oil accumulating chamber positioned between the rear end of said shaft and said rear valve plate and communicating with the oil separating chamber and the oil passage in said drive shaft to form a means for supplying sufficient oil to said thrust bearings for lubricating same immediately after said compressor is started, wherein the residual oil accumulating chamber comprises a hollow cylindrical member that is closed on an end facing said rear valve plate and is open at an end communicating with said drive shaft passage.

4,321,020

FLUID PUMP

Faquir C. Mittal, Audubon, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 103,880

Int. Cl.³ F04B *19/14, 17/00*

U.S. Cl. 417—320 **3 Claims**

1. Apparatus for developing a single pressurized fluid comprising:

(a) an enclosed member which is conformed into a racetrack configuration having a circular cross-section wherein a

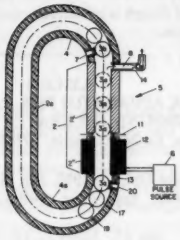
section of one leg of said racetrack configuration is utilized as a pressurizing chamber;

(b) fluid inlet means coupled near one end of said pressurizing chamber;

(c) fluid outlet means coupled near a second end of said pressurizing chamber;

(d) magnetic field generating means having a circular cross-section substantially similar to that of said pressurizing chamber coupled to the pressurizing chamber and occupying the remaining section of said leg of said racetrack configuration;

(e) feedback means comprising the remainder of said enclosed racetrack configuration member coupled to both said ends of said leg



(f) a plurality of magnetizable pistons in touching relationship located in said feedback means, wherein one such piston is positioned within said feedback means to pressure seal one end of said chamber, and a second such piston is positioned in the feedback means to seal the other end of said chamber in proximity to said magnetic field generating means;

(g) pulse means for applying a signal to said generating means to produce a momentary magnetic field with respect to said magnetizable piston in proximity thereto such that said piston is propelled through said chamber thereby pressurizing said fluid at said fluid outlet means,

said propelled piston impinging upon said piston sealing the opposite end of said chamber whereby each piston is advanced a distance within said feedback means such that a compression cycle may be repeated.

4,321,021

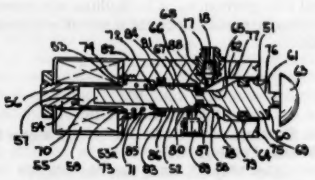
METERING PUMP

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Division of Ser. No. 637,647, Dec. 4, 1975, Pat. No. 4,189,285. This application Jun. 11, 1979, Ser. No. 47,779

Int. Cl.³ F04B *9/14, 17/04*

U.S. Cl. 417—374 **10 Claims**



1. A metering pump comprising:

an elongated housing with a bore passing therethrough having bore portions of different diameters along said bore length for receiving slidably a piston assembly therein of elongated piston portions of the diameters corresponding to the diameters of said bore, and a first housing end provided with a large bore end adaptable to be closed by an electrical solenoid operator which is disposed in an operable relationship with said piston assembly,

said piston assembly dividing said bore into a first pump actuating end provided with said solenoid operator and a second pumping end provided with different diameter pump chambers of which a first pump chamber adjacent a second housing end is larger while a second pump chamber spaced substantially between said first chamber and said solenoid operator is smaller, said first chamber including a first fluid supply port entering said housing bore via side wall perpendicularly to feed fluid into said first pump chamber receiving fluid volume larger than that receivable in said second chamber, an integral first check valve means between said first and second pump chambers maintained normally closed, including a second fluid exhaust port adjacent said first check valve means incorporated therein in said second pump chamber,

in combination with said solenoid operator, means for actuating said piston assembly from a first position allowing said first pump chamber to be filled by fluid entering via said first fluid supply port and a second position discharging a metered fluid quantity per stroke via said second exhaust port of said second pump chamber proportional to the difference of volumes said first larger chamber and said second smaller chamber provide when said piston assembly is moved therein, facilitating a cooperative effect in pumping wherein said first and said second chambers form but one combined variable volume chamber defining together with said piston portions of said piston assembly a pump delivery that provides volumetric displacement equivalent to the difference between said pump chambers after fluid from said first pump chamber is transferred to said second pump chamber when said large piston portion inside said first large pump chamber bottoms while said first fluid supply port is disconnected.

4,321,022

INTER-ENGAGING THREADED ROTOR AND PINION MACHINE WITH MULTI-EDGED PINION TOOTH FLANKS

Bernard Zimmern, Neuilly sur Seine, France, assignor to Uniscrew Limited, Hamilton, Bermuda

Filed Nov. 13, 1979, Ser. No. 93,444

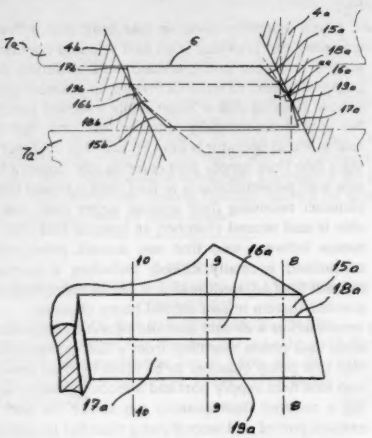
Claims priority, application France, Dec. 13, 1978, 78 35104

Int. Cl.³ F04C *18/00;* **F16H** *1/16, 55/08*

U.S. Cl. 418—195 **4 Claims**

1. In a machine for treating a fluid in a manner selected from compressing and expanding, comprising a rotor rotatable about an axis of rotation, a casing at least partially surrounding the rotor and at least one pinion which rotates about an axis which is not parallel to the rotor axis, said machine comprising at least one thread in a helix at least partially round the rotor, the crest of the thread being disposed on a surface of revolution about the rotor axis, the pinion having teeth which cooperate through the tips and flanks thereof with the threads to form a chamber by means of two successive threads and the casing, the improvement wherein at least the trailing teeth

flanks of the pinion comprise a skewed surface provided with at least two edges extending along at least a part of the length



of said flanks, said edges being located in front of each other along at least a part of their length.

4,321,023

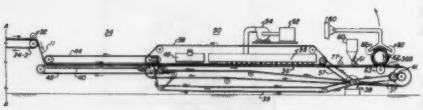
MACHINE FOR MAKING STRUDEL LEAF, DOUGH SHEETS

Klaus W. O. Rexroth, Northvale, N.J., assignor to Everex Corporation, Dumont, N.J.

Continuation-in-part of Ser. No. 360,923, May 16, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,216

Int. Cl.³ A21C *3/02*

U.S. Cl. 425—66 **10 Claims**



1. A machine for making strudel leaf, dough sheets from a wad of stretchable dough comprising:

thinning means for thinning the wad of stretchable dough as the dough moves through the machine;

a pair of transversely spaced, lower diverging belts mounted under the upper belts, all located beyond the thinning means in the direction of motion of the dough, so that each edge of the thinned wad of stretchable dough will be captured between an upper belt and a lower belt;

driving means for driving the diverging belts to thereby stretch the dough in a direction transverse to the direction of motion of the diverging belts to thereby produce a thin leaf of dough at the delivery ends of the diverging belts;

first pressure means operatively associated with the diverging belts for maintaining sufficient pressure between the upper and the lower diverging belts to hold the edges of the thinned wad of stretchable dough firmly therebetween as the dough is stretched in said transverse direction;

a drier located beyond the diverging belts in the direction of motion of the dough;

two pairs of further belts located beyond the diverging belts for gripping the thin leaf of dough therebetween and movable through the drier to thereby move the thin leaf of dough through the drier;

second pressure means operatively associated with the further belts for maintaining sufficient pressure between the two pairs of further belts to enable gripping and retention of the thin leaf of dough between the two pairs of belts as the thin leaf of dough passes through the drier;

support means mounted below the path of movement of the dough for supporting the dough, said support means extending, in the direction of movement of the dough, between the pairs of diverging belts and between the two pairs of further belts, the support means including first means extending between the pairs of diverging belts and second means extending between the two pairs of further belts; and

means for trimming excess dough from the thin leaf at the end of the pairs of diverging belts adjacent the corresponding end of the two pairs of further belts such that the thin leaf of dough is within the confines of the two pairs of further belts.

4,321,024

FORMWORK APPARATUS FOR CASTING DIRECTLY ON THE GROUND ACCURATE CONCRETE SLABS

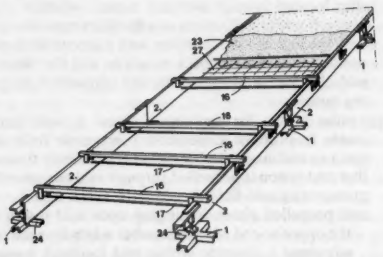
Paul Terraillon, Le Mont Gosse, F-74560 Monnetier-Mornex, France

Filed Oct. 17, 1980, Ser. No. 197,868

Claims priority, application Switzerland, Oct. 22, 1979, 9460/79

Int. Cl.³ B28B *21/60, 21/76*

U.S. Cl. 425—111 **5 Claims**



1. Formwork apparatus for casting directly on the ground accurate concrete slabs, by successive or adjacent bands, characterized in that it comprises supports provided for resting on the ground and for removably supporting metal forms and provided with accurate adjusting means for adjusting in elevation the forms, removable struts for fixing the gap between two parallel forms, tensioning wires intended to be stretched between the forms therethrough, and means for stretching these wires and securing them with respect to the forms, said adjusting means being a jack-screw having a thread of substantially semi-circular section and, between the turns of the thread, a cylindrical root portion, so as to facilitate the removal of the residual concrete remaining on the screw after dismounting the formwork.

4,321,025

EXTRUSION DIE

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 12, 1980, Ser. No. 148,797

Int. Cl.³ B28B *3/26*

U.S. Cl. 425—131.1 **17 Claims**

1. In an extrusion die for forming honeycomb structures of the type having:

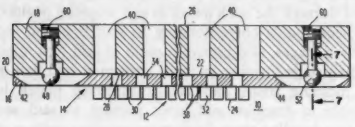
a first body member having an inlet face and an outlet face, a first plurality of feed holes opening to said inlet face and communicating with a second plurality of interconnected discharge slots opening to said outlet face; and

a second body member having an entrance face and an exit face, a third plurality of feed passageways extending through said second body member from said entrance face to said exit face;

said first and said second body members being adapted to be bonded to one another at a joint between said exit face and said inlet face, the improvement comprising:

a first alignment cavity in one of said body members opening to and diverging towards and to said joint;

at least another alignment cavity in either said one or the other of said body members, said another alignment cavity opening to and diverging towards and to said joint; and



at least first, second and third pedestals on the body member or members and projecting across or onto said joint, said first and said second pedestals projecting across said joint from the body member or members opposite to and mating with said first and said another alignment cavities respectively, said alignment cavities and pedestals restraining said body members from relative movement in two orthogonal directions but allowing relative movement therebetween in a third orthogonal direction perpendicular to the joint during bonding thereof.

4,321,026

DEVICE FOR GRANULATING PLASTIC STRANDS

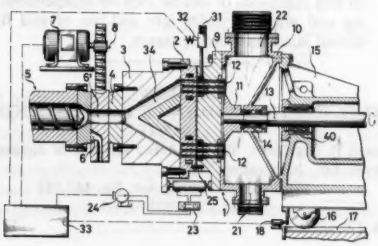
Friedrich Lambertus, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,444

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814113

Int. Cl.³ B29B *1/03*

U.S. Cl. 425—142 **10 Claims**



1. In a device for granulating plastic strands having a nozzle plate with boreholes arranged in front of a manifold and a starting valve, connected with the latter, of an extruder, and a cutting device with knife head, arranged centrally in a receiving housing, the cutting knives of the knife head rotating in the region of emergence of plastic strands which are acted on radially by a coolant, the improvement comprising a removable cutting plate and an insulating layer disposed between the nozzle plate and the cutting plate, said cutting plate being provided with cooling boreholes aligned axially with the nozzle boreholes of the nozzle plate and extending up to said insulating layer, an annular recess surrounding a portion of said cooling boreholes and in communication therewith, a feed line connected to said recess to supply coolant thereto and thereby to the cooling boreholes, said cutting plate being connected to said receiving housing to form a unitary structure with said receiving housing and the knife head, and drive means for selectively displacing said unitary structure with the cutting plate and said nozzle plate between separated and engaged positions.

4,321,027

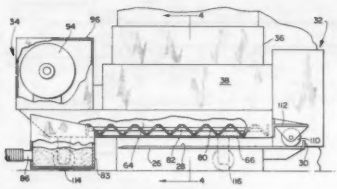
UNDER THE PRESS GRANULATOR CONSTRUCTION

Steven M. Stoehr, Hingham; Fred W. Hannula, Medfield; Thomas J. Dumaine, North Attleboro, all of Mass.; Robert D. Batting, Barrington, R.I., and Earl D. Smithern, Buffalo Grove, Ill., assignors to Leesona Corporation, Warwick, R.I.

Filed Jun. 18, 1979, Ser. No. 49,573

Int. Cl.³ B29C *29/00*

U.S. Cl. 425—216 **7 Claims**

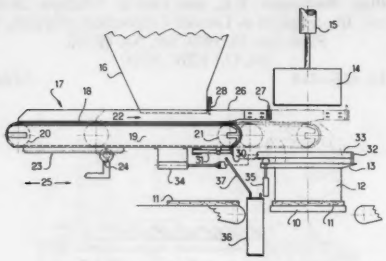


1. In combination with a machine for the injection molding of plastic material parts, a granulator for the size reduction of the plastic scrap such as sprues and runners simultaneously formed with said parts, said machine having means for injecting fluid plastic material into a mold cavity formed between opposed mold portions and means for supporting said mold portions so as to enable them to be opened and closed in conjunction with the injection of said material thereinto, said machine further of an overall elongated configuration wherein said mold portions move relative to each other in a longitudinal direction, said machine additionally including an open drop out area beneath said mold portions into which said scrap may drop as by gravity upon the opening of said mold portions, said drop out area having an opening on at least one of the lateral sides of said machine, said granulator having opposite first and second ends and adapted for positioning essentially entirely within said drop out area in an operative position thereof with respect to said machine and for lateral movement with respect to said machine so that said second end extends outwardly of said opening in an inoperative position thereof, said granulator having elongated walls defining a generally enclosed chamber, an elongated rotor mounted for rotation about an elongated axis within said chamber, outting means affixed in said rotor, bed knife means mounted for projection into said chamber at least on the rotor downstroke side thereof for cooperative cutting relationship with said cutting means as said rotor is driven, elongated feed means positioned in said chamber above said rotor and generally aligned therewith and at least partially enclosing said chamber at the upper end thereof whereby scrap falls directly into said granulator feed means from said mold portions, and elongated removal means positioned below said chamber and generally aligned therewith for removing granulated scrap from said granulator to a location at said second end, said machine including a pair of spaced rails laterally disposed within said drop out area thereof and oriented generally traversely with respect to the overall longitudinal disposition of said machine, said granulator including a first pair of wheels at said first end thereof adapted for rolling engagement with said rails, a second pair of wheels at said opposite end thereof, said second wheels adapted for rolling engagement with the surface on which said machine is supported and on a plane below that defined by said rails whereby said granulator and said first end thereof may be rolled laterally into and out of said drop out area between operative and non-operative positions of said granulator respectively.

4,321,028
CONCRETE MOLDING APPARATUS INCLUDING RECIPROCATING BELT FEEDER

Yves H. Van de Caveye, Beauvais, France, assignor to Societe d'Exploitation des Establishments Minato, France

Filed Aug. 11, 1980, Ser. No. 177,060
Claims priority, application France, Aug. 9, 1979, 79 20373
Int. Cl.[3] B28B *1/08, 1/04*
U.S. Cl. 425—217 14 Claims

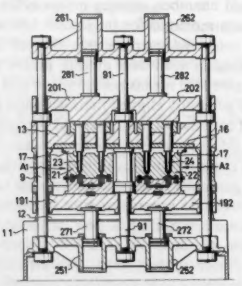


1. A press for moulding concrete products, comprising a vibrating table, a mould adapted to be put onto the vibrating table and to be filled with concrete, a concrete feed means such as a hopper and means provided between said hopper and said mould to fill said mould with a predetermined amount of concrete, wherein the improvement consists in that the mould filling means comprise an endless belt conveyor arranged below said hopper and including means for driving said belt in a predetermined direction, means for bodily displacing said conveyor according to a linear reciprocating motion so as to pass the forward end of said conveyor above said mould and bring it back to an initial position; and means for cleaning the top of said mold attached to reciprocal means supporting the conveyor.

4,321,029
INJECTION BLOW MOLDER FOR DUPLEX HOLLOW MOLDED ARTICLES

Katashi Aoki, 6037, Ohaza Minamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

Filed Feb. 15, 1980, Ser. No. 121,684
Claims priority, application Japan, Feb. 20, 1979, 54-18696
Int. Cl.[3] B29C *17/07*
U.S. Cl. 425—523 2 Claims



1. An injection blow molder for molding double-layered or duplex hollow molded articles having:

a transferring platen disposed horizontally above a generally horizontal lower base said transferring platen having five equidistantly spaced neck molds secured to the undersurface thereof, said transferring platen being arranged for intermittent rotation through a predetermined angle and being disposed at the undersurface of an upper base platen supported horizontally above the lower base by a plurality of tie rods securely connecting the upper base platen to the lower base;

five operation stages equidistantly spaced on said lower base, said operation stages being a first injection molding stage, a second injection molding stage, a heating stage, a stretching and blowing stage, and a molded product releasing stage, each disposed at a position corresponding to one stopping position of the neck molds on said transferring platen;

the first and second injection molding stages each having a separate injection mold for cooperating with cores inserted through the neck molds at said stopping positions of said neck molds corresponding to said first and second injection stages, said injection mold at said first injection molding stage forming an inner parison at said first injection molding stage, and said transferring platen being operable to transfer said inner parison to said second injection molding stage for forming an outer parison about said inner parison in said injection mold at said second injection molding stage;

one of said tie rods being positioned adjacent a first side of said first injection molding stage, a second of said tie rods being positioned adjacent the opposite side of said second injection molding stage, and a third tie rod being located between said first and second injection molding stages, each of said three tie rods including an extension extending above said upper base platen and below said lower base;

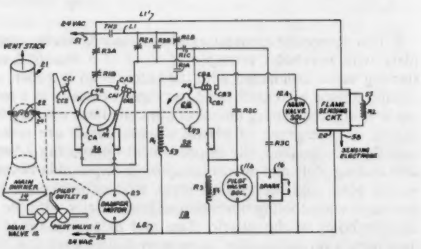
a separate clamping mechanism disposed above the upper base platen at each of said first and second injection molding stages, each of said clamping mechanisms including an upper mold clamping plate guided for vertical movement on said extensions of said tie rods for independently moving said cores into and out of said first and second injection molding stages; and

a separate clamping mechanism disposed below the lower base at each of said first and second injection molding stages, each of said clamping mechanisms including a lower mold clamping plate guided for vertical movement on said extensions of said tie rods for independently moving said injection molds into and out of said first and second injection molding stages.

4,321,030
FUEL IGNITION AND STACK DAMPER CONTROL CIRCUIT

Russell B. Matthews, Tuscon, Ariz., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Mar. 13, 1980, Ser. No. 130,141
Int. Cl.[3] F23H *3/00*
U.S. Cl. 431—20 17 Claims



1. In a heating system including a furnace having a fuel fired burner apparatus with a solenoid operated pilot valve operable when energized to supply fuel to a pilot output for ignition by sparks provided by a spark generator to provide a pilot flame,

and a solenoid operated main valve operable when energized to supply fuel to a main burner for ignition by the pilot flame; a vent stack for venting combustion products away from said burner apparatus, and stack damper means including a stack damper plate mounted within said vent stack and movable between closed and open positions under the control of a drive motor; a control circuit for controlling the operation of said fuel valves and said drive motor comprising: activate switch means operated in response to a request for heat to energize said drive motor to cause said damper plate to be driven from its closed position to its open position; first switching means responsive to the operation of said activate switch means to energize the pilot valve solenoid and said spark generator during a trial for ignition time interval defined by the excursion time of the damper plate as it is driven from its closed position to its open position; flame sensing means operable when a pilot flame is sensed during said time interval to maintain said pilot valve operated after the end of said time interval, and second switching means operated at the end of said time interval to effect the deenergization of said pilot valve if a pilot flame fails to be sensed during said time interval.

4,321,031
METHOD AND APPARATUS FOR CONDENSATION HEATING

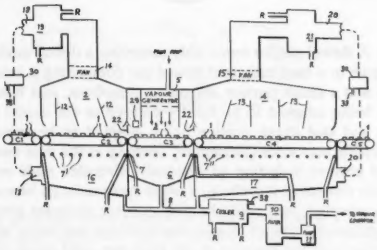
Ralph W. Woodgate, 1380 Grande Allee, Carignan, Canada

Filed Jul. 8, 1980, Ser. No. 167,151

Claims priority, application United Kingdom, Jul. 9, 1979, 23904/79; Oct. 4, 1979, 34554/79

Int. Cl.³ F27D *3/00*; F22B *1/28*; F27B *9/04*

U.S. Cl. 432—11 **29 Claims**



25. A soldering method comprising:

heating an electrically conductive porous material having interconnected pores by applying an electric current thereto;

introducing fluid to be vaporized into said porous material to form a heat transfer vapor; and

applying said heat transfer vapor to an article to be soldered.

4,321,032
PROCESS FOR THE TREATMENT OF COMBUSTIBLE GRANULAR AND/OR PULVERULENT MATERIAL BY DRYING AND/OR HEATING, AND AN INSTALLATION FOR CARRYING OUT THE PROCESS

Henri Brice, St-Avold; Roger M. Puff, Freyming-Merlebach, and Jean-Claude Kita, Forbach,all of France, assignors to Charbonnages de France, Paris, France

Filed Sep. 24, 1980, Ser. No. 190,256

Claims priority, application France, Sep. 26, 1979, 79 23920; Jun. 10, 1980, 80 12876

Int. Cl.³ F27B *15/00*

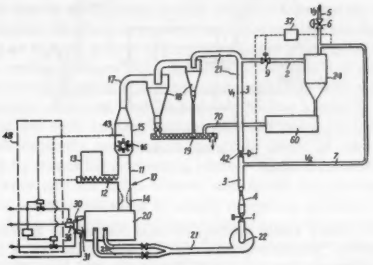
U.S. Cl. 432—14 **13 Claims**

1. In a process for treating a particulate combustible material in which the combustible material is dried and heated by conveying fluidization, said process including the steps of:

(1) introducing the material into a fluidization space and heating the material so introduced to a pedetermined temperature with a neutral gaseous agent which is supplied at a predetermined temperature and in predetermined amounts from a combustion chamber;

(2) removing the heated combustible material from the fluidization space by pneumatic transport while entrained and fluidized in the outflowing gaseous agent;

(3) separating the combustible material from the outflowing gaseous agent by dividing the gaseous agent, in predetermined amounts, between (a) a recycling line leading to the combustion chamber, and (b) an outlet for removing excess of the gaseous agent; and



(4) freeing the excess gaseous agent from dust with a dry dust remover;

the improvement including:

A. subjecting a predetermined amount of the recycled gaseous agent removed in step (3) (a) to dry dust removal, at least when the introduction of the particulate combustible material in step (1) is interrupted; and

B. regulating the amount of recycled gaseous agent which has been subjected to dust removal by controlling the throughput of gas, which has been subjected to dust removal, within predetermined values.

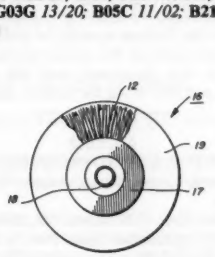
4,321,033
THERMALLY CONDUCTIVE FUSING DEVICE

Clifford O. Eddy, Webster, and Donald A. Seanor, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1980, Ser. No. 201,900

Int. Cl.³ G03G *13/20*; B05C *11/02*; B21B *31/08*

U.S. Cl. 432—60 **13 Claims**



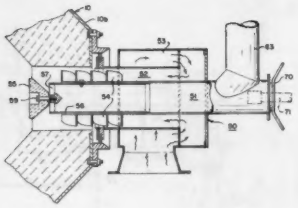
13. A fuser roll for use in an electrostatographic copying apparatus comprising a central heating element, a thermally conductive cylindrical base substrate surrounding said heating element and a cylindrical thermally conductive layer coated on said substrate comprising a plurality of thermally conductive fibers in the form of a brush, said fibers being impregnated with an elastomer possessing adhesive properties, said plurality of fibers being radially oriented in a direction from said substrate to the exposed surface of said thermally conductive layer to provide a conductive path from the substrate to the roll surface.

4,321,034

COAL BURNERS, ROTARY FURNACES INCORPORATING THE SAME AND METHODS OF OPERATING

Charles C. Taccone, Clearfield, Pa., assignor to Clearfield Machine Company, Clearfield, Pa.

Filed Apr. 3, 1980, Ser. No. 136,886
Int. Cl.³ F27B 7/02; F23K 5/00
U.S. Cl. 432—105 8 Claims



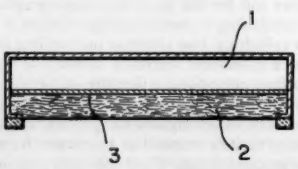
1. A rotary metal melting furnace comprising a generally cylindrical furnace rotatable about a horizontal axis, a charging opening at one end of said furnace on said horizontal axis, means for rotating said furnace about its axis, a burner opening at the other end of said furnace on said axis, burner means in said burner opening, said burner means including a generally cylindrical burner housing coaxial with the furnace housing, a fuel inlet tube spaced inwardly from and coaxial of the burner housing and forming a combustion air passage there-between said fuel inlet tube having spaced discharge and inlet ends, a refractory heat resistant imperforate generally conical diverter member on the discharge end of said inlet tube in the path of fuel in said fuel inlet tube forming a generally conical discharge pattern in the fuel leaving the fuel inlet tube around the exterior of said diverter member, a generally helical flight between the outer periphery of the inlet tube and the interior of the burner housing beginning at a point intermediate the ends of said inlet tube and within the combustion air passage surrounding the fuel inlet tube and terminating adjacent the diverter, means delivering pre-heated air to the combustion air passage spaced from the helical flight opposite the diverter member, means normally delivering pulverized coal in fluid suspension to said inlet tube adjacent the inlet end, means removably insertable into the inlet end of said fuel inlet tube for delivering a stream of fluid hydrocarbon fuel for furnace start-up and preheating when a cover is removed, recuperator means communicating with the exhaust opening of said furnace and coal pulverizing means adjacent the burner opening and fluidizing means receiving said pulverized coal and suspending said pulverized coal and delivering the same to said fuel inlet tube.

4,321,035

HEAT-INSULATING CONSTRUCTION

Masaru Takashima, Komae, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1980, Ser. No. 128,044
Claims priority, application Japan, Nov. 9, 1979, 54-154781
Int. Cl.³ B32B 9/00, 15/04; F27D 1/18
U.S. Cl. 432—250 10 Claims



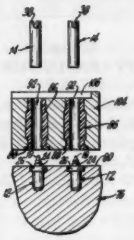
1. A cover for use with a high temperature chamber comprising a sealed insulating chamber having a heat reflective lower outer surface for reflecting radiant heat energy back towards the interior of the high temperature chamber, and refractory fiber layer means connected to said sealed insulating chamber at said reflective lower surface thereof for shielding said sealed insulating chamber from the interior of the high temperature chamber.

4,321,036

PROSTHODONTIC DOWEL PIN

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 903,744, May 8, 1978, Pat. No. 4,205,443. This application Feb. 15, 1980, Ser. No. 121,833
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.³ A61C 19/00
U.S. Cl. 433—74 11 Claims



1. A dowel pin for removably mounting a dental model cast relative to a base cast, said dowel pin comprising a head portion and a shank portion extending therefrom, said head portion being adapted to be fixedly secured in the dental model cast and said shank portion being adapted to be removably insertable into a complementary opening in the base cast, said head portion including an externally threaded male member axially extending therefrom, a collar surrounding a base of said male member, said collar having an outer diameter proximating an outer diameter of said shank portion and being adapted to enter into the opening in the base cast, said shank portion having internally disposed complementary threads defining a female member for receiving said male member therein, said head portion and said shank portion being selectively engageable in axial alignment with each other and also being disengageable from each other, both when the dental model cast is mounted on the base cast as well as when the dental model cast and the base cast are separated, a free end of said male member being unthreaded to provide a pilot portion for guiding said male member into said female member.

4,321,037

METHOD OF ILLUSTRATING HOW THE OUTSIDE OF A BUILDING WILL APPEAR TO THE VIEWER IF A BUILDING MATERIAL IS ADDED TO THE OUTSIDE OF THE BUILDING

Melvin L. Miller, 395 Highland Dr., Payette, Id. 83661

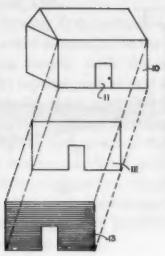
Continuation of Ser. No. 958,068, Nov. 6, 1978, abandoned. This application Oct. 9, 1980, Ser. No. 195,442
Int. Cl.³ G09B 25/04
U.S. Cl. 434—74 11 Claims

1. The method of using an illustration of a structure comprising a building to show how that structure would appear if a different building material is to be added to such structure comprising:

providing a plurality of sheets illustrating said building material with each such sheet to a different scale,

selecting the particular sheet which when applied to said

illustration will be the closest approach to showing how said structure will appear if said building material is applied thereto,



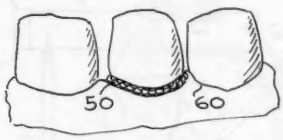
covering at least a portion of said illustration with at least a portion of said selected sheet to thereby show how said structure will appear if said building material is applied thereto.

4,321,038

BRAIDED GINGIVAL RETRACTION CORD

Don D. Porteous, Los Angeles, Calif., assignor to Van R Dental Products, Inc., Los Angeles, Calif.

Filed Jul. 18, 1980, Ser. No. 170,289
Int. Cl.³ A61C 5/14
U.S. Cl. 433—136 24 Claims



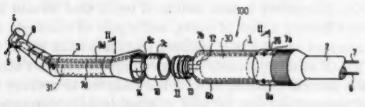
1. A gingival tissue retraction cord comprising a suitably dimensioned, moderately firm, flexible, multistrand, braided, absorbent cord impregnated with an effective amount of gingival tissue retraction material.

4,321,039

DENTAL HANDPIECE

Werner Schuss, Heppenheim, and Hans J. Klose, Hemsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,060
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929483
Int. Cl.³ A61C 1/12
U.S. Cl. 433—82 8 Claims



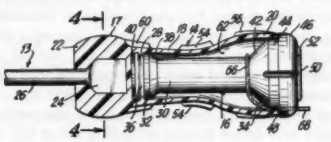
1. In a dental handpiece having a drive section detachably connected to a handle section for relative rotation therewith, said drive section having a housing containing a drive motor with a drive shaft and having an axially extending guide sleeve projecting from an end thereof, and said handle section having means for transferring the rotation of the drive shaft to a rotatable acceptance socket for receiving a tooth treatment instrument, said handpiece having at least one cooling medium line being formed by line segments arranged in said drive section and said handle section for conveying a cooling medium to a nozzle adjacent said acceptance socket, each of said cooling medium lines including a rotatable coupling of an annlar channel and a coacting radial opening to enable relative rotation between a line segment in the drive section and a line segment in the handle section, the improvements comprising the handle section having a guide sleeve projecting from an end thereof and being telescopically received in the guide sleeve of the drive section, the rotatable couplings being formed by first and second sleeves being telescopically received together for relative rotation therebetween, one of said first and second sleeves having an annular groove to form the annular channel for each of the cooling medium lines, the other of said first and second sleeves having a radial opening in communication with each of the annular channels, said first sleeve having a cooling line segment for each cooling medium line and being detachably and telescopically mounted on the guide sleeve of the drive section by means for preventing relative rotation between the first sleeve and the drive section, said means for preventing relative rotation including an axially extending groove in said guide sleeve of the drive section and a groove in the housing of the drive section for receiving each line segment secured to the first sleeve, and said second sleeve having a cooling line segment for each cooling medium line and being detachably mounted on the handle section by means for preventing relative rotation between the handle section and the second seleve so that each of the sleeves rotate with their respective section as a result of the rotation between the sections.

4,321,040

ENDODONTIC INSTRUMENT

Alan Miller, New City; Edward E. Schweizer, Katonah, both of N.Y., and John E. Companello, Caldwell, N.J., assignors to Ipco Corporation, White Plains, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,665
Int. Cl.³ A01C 5/02
U.S. Cl. 433—102 18 Claims



1. An endodontic instrument comprising:

a handle;

a blade extending outwardly from a front end portion of said handle;

connecting means securing said blade in said front end portion of said handle for rotating said blade and said handle together;

said handle including an elongated sleeve member and a core member disposed within said sleeve member;

said sleeve member including a forward end and a tail end with a central section disposed betwecn said forward and tail ends, said central section being hollow to provide a hollow interior therein, said tail end having an axial opening therethrough communicating with said hollow interior;

said core member including a longitudinal body portion having a head portion at one end and an enlarged base portion at an opposite end thereof;

said body portion being disposed in said hollow interior of said sleeve member with said body portion being radially spaced from inner walls of said sleeve member to define therebetween a flexure space for accommodating deformation of said sleeve member upon gripping thereof during use of the instrument;

engagement means for securing said head portion of said core member at said forward end of said sleeve member to prevent longitudinal movement between said head portion and said forward end;

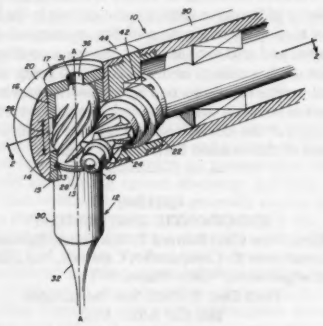
said tail end of said sleeve member being free and resting on said base portion of said core member which is disposed within said axial opening of said tail end so that said tail end is free to ride along said base portion during said deformation of said sleeve member; and

said sleeve member including resilient means for permitting said central section to be radially inwardly deformed into said flexure space towards said core member.

4,321,041
MINIATURIZED CONTRA-ANGLE

Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159, and Anselm Yaron, Brookline, Mass., assignors to Leopold Paul Lustig, Newton, Mass.

Filed Nov. 24, 1980, Ser. No. 209,877
Int. Cl.³ A61C *1/12, 3/02*
U.S. Cl. 433—133 **17 Claims**



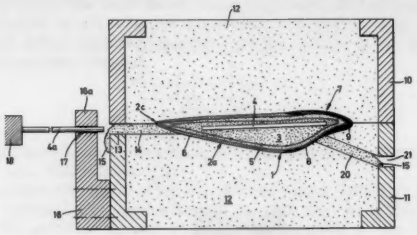
1. A contra-angle type operator mechanism for rotatable tools particularly adapted for construction in miniature size comprising, in combination, housing means having a cylindrical bore extending on a first axis, first and second tubular guides in said bore spaced apart collinearly on said first axis with an access space between them, a tool-driver that is rotatable around a second axis passing by but not intersecting said first axis, said tool-driver having extending along said second axis a first set of helical gears which intersects said access space for coupling with a second set of helical gears when said second set of gears is present in said access space rotatably held between said guides and extending along said first axis, said cylindrical bore having at one end an access opening for inserting into and removing from said guides a rotatable tool bearing on its periphery said second set of helical gears, and means in one of said tubuar guides for retaining a rotatable tool in said bore.

4,321,042
CERAMIC DENTAL IMPLANT

Hans Scheicher, Rondell Neuwittelsbach 4, D 8000 Munich 19, Fed. Rep. of Germany

Continuation of Ser. No. 778,284, Mar. 16, 1977, abandoned.
This application Feb. 18, 1981, Ser. No. 235,401
Claims priority, application Sweden, Mar. 16, 1976, 7603291
Int. Cl.³ C09K *3/00*
U.S. Cl. 433—201 **15 Claims**

1. A dental implant wherein the surface portion thereof where tissue ingrowth is to occur is sintered and porous and comprises a biocompatible dental ceramic matrix containing about 0.02 to 0.05 wt. percent inorganic fibers having a diameter of less than about 0.6 mm and a length of about 0.1 to 60 mm, said surface portion comprising pores of an average pore diameter of approximately 100 to 200 μm and said inorganic

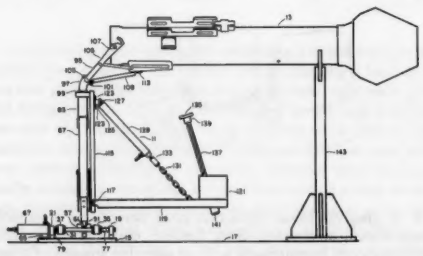


fibers having a melting temperature higher than the sintering temperature of said matrix.

4,321,043
RECOIL FORCE AND WEIGHT LOSS SIMULATION DEVICE

Paul D. Grimmer, Winter Park, and Edmund Swiatosz, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1980, Ser. No. 208,757
Int. Cl.³ F41F *27/00*
U.S. Cl. 434—18 **12 Claims**



1. A recoil and weight loss simulation device comprising in combination:

a weight located at a predetermined position above a terrain surface, said weight having an internally threaded aperture extending therethrough;

an imitation weapon having a trigger mechanism, said trigger mechanism having an input and output;

an adjustable height weapons support stand having a pair of legs, each leg of which has on the end thereof a tip;

a weapons brace assembly rotatably mounted on said adjustable height weapons support stand, said weapons brace assembly having a yoke affixed to the periphery of said imitation weapon;

first force generating means mounted upon said terrain surface and having a pair of ports, and a pair of channels, the first channel of which is adapted to receive the tip of the first leg of said adjustable height weapons support stand, and the second channel of which is adapted to receive the tip of the second leg of said adjustable height weapons support stand, for simulating the recoil force that a marksman experiences upon activating the trigger mechanism of said weapon by moving said weapon in a rearward direction against the shoulder of said marksman;

second force generating means fixedly attached to said adjustable height weapons support stand, having said weight effectively connected thereto, and having a port adapted for simulating the weight loss that a marksman experi-

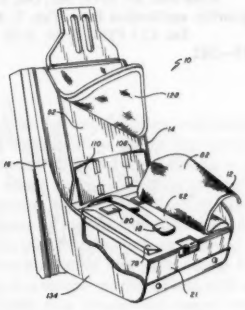
ences upon firing said imitation weapon by allowing said weight to fall freely from said predetermined position above said terrain surface to said terrain surface whenever said marksman activates the trigger mechanism of said imitation weapon; and

actuating means having first, second, and third ports with the first port thereof connected to the first port of said first force generating means, with the second port thereof connected to the second port of said first force generating means, and with the third port thereof connected to the port of said second force generating means for simultaneously effecting the activation of said first force generating means, and said second force generating means whenever said marksman triggers the trigger mechanism of said imitation such that said marksman will experience the recoil force and weight loss generating by the firing of said imitation weapon.

4,321,044
ADVANCED G CUEING SYSTEM

Gerald J. Kron, Binghamton, N.Y., assignor to The Singer Company, Binghampton, N.Y.

Filed Nov. 14, 1978, Ser. No. 960,525
Int. Cl.³ G09B *9/08*; A47C *1/00*
U.S. Cl. 434—59 **22 Claims**



1. A G-seat system for use in simulating vehicular motion and maneuvers, comprising:

a. dynamic seat means comprising

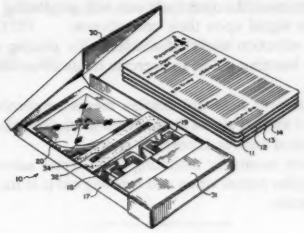
1. a singular, substantially rigid surface for supporting the buttocks of a seated subject, said surface being provided with left and right associated surface elements running longitudinally along the left and right thereof for subject outer thigh contact,
2. first means for selectively altering the position and attitude of said surface to produce a desired body excursion of the seated subject, and
3. first and second firmness cells located between said surface and the buttocks of said subject, one on each side of said surface, left and right, for varying perceived seat hardness and area of flesh contact of the seated subject; and

b. second means for coordinating the operation of said first means and said left and right firmness cells to produce body excursions and variations in perceived seat hardness and area of flesh contact comparable to those in an operational vehicle.

4,321,045
BRIDGE LEARNING AND PLAYING KIT

Helen L. Crowley, 9410 S. Richmond, Evergreen Park, Ill. 60642

Filed Aug. 18, 1980, Ser. No. 178,853
Int. Cl.³ G09B *19/22*
U.S. Cl. 434—129 **10 Claims**

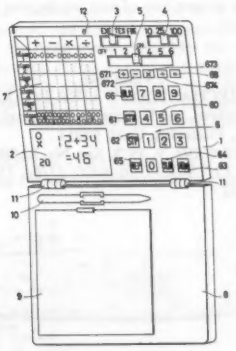


1. A bridge learning and playing kit comprising four position cards, the first position card having information thereon for instructing a first bridge player how to bid in the game of bridge on the opening bid and subsequent bids, the second position card having information thereon for instructing the second player how to respond to the opening bid and make subsequent bids, the third position card having information thereon to instruct a third player how to respond to the first and second bids and what subsequent bids to make, and the fourth position card having information thereon for instructing a fourth player how to respond to the first, second and third bids and what subsequent bids to make, the cards being passable around a card table to the different positions of the players after each hand is played and said cards being made of stiff paperboard material and having a length and width sufficient to enable the instructions to be placed thereon in easily readable type size.

4,321,046
ELECTRONIC LEARNING AID OPERABLE IN AN EXAMINATION MODE

Koiti Oda, Sakai; Yoshiro Kataoka, Hitoyoshi, and Takashi Sakaue, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

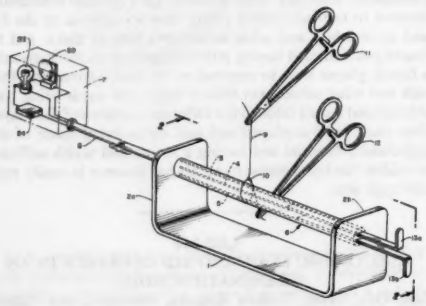
Filed Nov. 28, 1979, Ser. No. 98,077
Claims priority, application Japan, Nov. 29, 1978, 53-148053
Int. Cl.³ G09B *19/02*
U.S. Cl. 434—201 **4 Claims**



1. An electronic learning aid for teaching addition, subtraction, multiplication, or division, comprising:

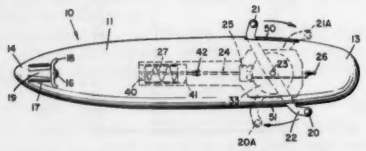
means for automatically generating a multidigit problem having two operands and an arithmetic function;
display means for displaying said problem;
input means for introducing an operator calculated answer for said problem;
calculation means for determining the correct answer to said problem;
comparator means for comparing the operator calculated answer to said correct answer and producing a correct answer signal upon their coincidence;
a mode selection switch for selectively placing said electronic learning aid in an exercise mode or an examination mode;
correct answer indicator display means responsive to said correct answer signal for indicating whether the operator calculated answer is correct; and
prohibition means for inhibiting said correct answer indicator display means when said learning aid is in the examination mode.

4,321,047
SIMULATOR AND PROCESS FOR TEACHING SURGICAL KNOT TYING TECHNIQUES
Bradley Landis, 704 Westholme Ave., Los Angeles, Calif. 90024
Filed Jun. 5, 1980, Ser. No. 156,839
Int. Cl.³ G09B *23/28*
U.S. Cl. 434—262 **10 Claims**



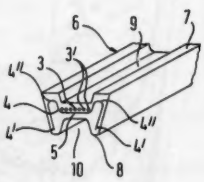
1. Simulator for teaching surgical knot tying techniques comprising:
flexible tube means adapted to be encircled by a tightenable surgical loop;
a plurality of conductive means within said tube means;
signal means for indicating when manipulation of the loop has caused at least two of said conductive means to come into contact.

4,321,048
MECHANIZED WATER BOARD
Michele J. Marchese, and William R. W. Troxel, both of 845 St. Kathrine Dr., Flintridge, Calif. 91011
Filed Oct. 9, 1979, Ser. No. 82,782
Int. Cl.³ A63C *5/00, 9/00, 11/00, 15/00*
U.S. Cl. 440—32 **7 Claims**



1. A propelled surfboard comprising,
an elongated surfboard body member having a generally planar configuration with a front end and a tail end,
propulsion means including a screw propeller disposed beneath said body member, and
drive means coupled to said propulsion means for causing operation thereof to impart motion to said surfboard,
said drive means including lever means pivotally mounted near said front end of said body member and arranged to operate substantially horizontally within the planar configuration of said body member,
said drive means further including ratchet wheel means selectively engaged and driven by said lever means,
said drive means further including gear means selectively driven by said ratchet wheel means, and
drive shaft means connecting said gear means to said propulsion means,
said lever means including pawls thereon for engaging said ratchet wheel means,
said ratchet wheel means including toothed perimeter edges for driving said gear means.

4,321,049
POWER TRANSMISSION BELT
Giorgio Tangorra, Monza, and Giulio Cappa, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy
Filed Jan. 29, 1979, Ser. No. 7,172
Claims priority, application Italy, Feb. 7, 1978, 20042 A/78
Int. Cl.³ F16G *5/08, 5/10*
U.S. Cl. 474—242 **5 Claims**



1. A belt for association with a pulley for power transmission comprising an elastomeric or plastomeric body member having a first base, a second base smaller transversally than said first base and two converging straight side edges which extend between said bases, a continuous longitudinal groove in one of said bases of said body member, a tension resisting insert member of spaced, parallel, coplanar, non-woven, inextensible wires or threads embedded in said body member parallel to said bases, a plurality of transverse, longitudinally spaced rigid members having a constant thickness and two dimensions predominant with respect to the third and extending integrally with a first portion along a first side edge of the belt adjacent and parallel thereto and extending the entire length thereof, with a second portion along a base of the belt parallel and adjacent thereto and with a third portion along a second side edge of the belt adjacent and parallel thereto and extending the entire length thereof, said first portion being connected to said second and third portions, respectively by a ninety degree loop, said transverse rigid members being fully embedded and distributed at substantially equal intervals along the length of the belt, said transverse rigid members having said second portion contacting the tension resisting insert member.

4,321,050

APPARATUS FOR SEVERING AND SHIFTING PLUGS FOR CIGARETTES OR THE LIKE

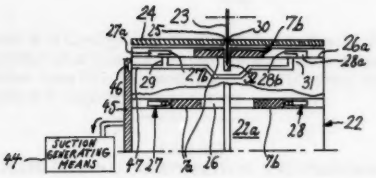
Erwin Oesterling, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 831,884, Sep. 9, 1977, abandoned. This application May 22, 1979, Ser. No. 41,316

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640567

Int. Cl.³ A24C 5/50

U.S. Cl. 493—45 9 Claims



1. In an apparatus for manipulating rod-shaped articles, particularly in an apparatus for assembling composite filter plugs, the combination of a conveyor having a plurality of article receiving means and a pair of spaced apart stops for each receiving means; means for advancing said receiving means sideways along an endless path; means for feeding rod-shaped articles into said receiving means between the respective stops in a first portion of said path; means for severing successive articles in a second portion of said path so that each severed article yields two coaxial rod-shaped sections; and means for moving the sections of successive severed articles apart and into abutment with the respective stops immediately upon completed severing of the respective articles, including means for establishing a pressure differential between the ends of sections with the lower-pressure zone located at that end of each section which faces the respective stop so as to induce axial movement of said sections against the respective stops, said pressure differential establishing means comprising a shroud overlying the receiving means in said second portion of said path and suction ports provided in said receiving means in the region of said stops.

4,321,051

METHOD OF MAKING A FOLDING FORMER

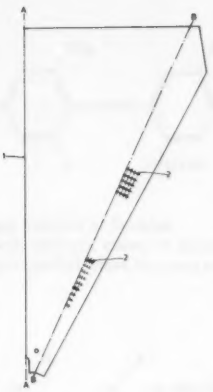
Josef Hajek, Friedberg-Stätzling; Siegfried Rotter, Augsburg; Hans Schwöpfinger, Augsburg, and Josef Schwarz, Augsburg, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,355

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921757

Int. Cl.³ B65H 45/22

U.S. Cl. 493—439 7 Claims



1. Method to make a folding triangle or former for association with a rotary printing machine, having lateral air communication ducts (4) and air communication openings (2) extending through the former at marginal portions thereof,

comprising, in accordance with the invention, the steps of

providing a flat sheet metal former element of essentially triangular outline;

forming the air communication openings (2) therein at a marginal portion along an edge of the former element;

bending the marginal portion having the communication openings in a continuously conically formed shape, to form open bent-over inned sides of the marginal portions and define an open space between said bent-over marginal portions and a major portion of the flat sheet metal element;

providing at least one core element of a material subject to being dissolved in a solvent, and having a conical shape matching at least a portion of the conically decreasing edge portion of the former, and positioning said core element in the open space defined by the bent-over marginal portion and fitting against said marginal portion;

pouring a curable or hardenable resin over the core element engaging the walls of the former to form a bridge between the bent-over marginal portion and the flat portion of the former;

permitting said resin to harden or cure;

and dissolving the core element with a solvent.

4,321,052

USE OF ALKYLPOLYGLYCOL-TERT.-BUTYL ETHER AS BLEACHING AUXILIARY AND BLEACHING BATHS CONTAINING THIS AGENT

Otto Smerz, Kelkheim; Thomas Martini, Bad Soden am Taunus; Siegfried Billenstein, Burgkirchen, and Klaus Adrian, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

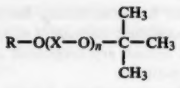
Filed Apr. 17, 1981, Ser. No. 255,351

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015958

Int. Cl.³ D06L *3/02;* C11D *3/395*

U.S. Cl. 8—107 3 Claims

1. A process for the bleaching of cellulose in an alkaline peroxide bleaching bath in the presence of a compound of the formula



wherein R is C_6–C_{22}-alkyl, C_6–C_{22}-alkenyl or C_{22}-alkylaryl n is a number of of from 5 to 50, and X is ethylene or propylene; the ether chain $(X—O)_n$ consisting entirely of ethoxy units or contains n/5 isopropoxy units at most.

4,321,053

HAIR DYEING COMPOSITION AND PROCESS

Eugen Konrad, Darmstadt, Fed. Rep. of Germany, and Herbert Mager, Fribourg, Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,292

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906108

Int. Cl.³ A61K *7/13*

U.S. Cl. 8—407 18 Claims

1. A composition for oxidative dyeing of hair comprising a member of the group consisting of

1,5-dihydroxy-1,2,3,4-tetrahydronaphthalene,
2,5-dihydroxy-1,2,3,4-tetrahydronaphthalene,
3,5-dihydroxy-1,2,3,4-tetrahydronaphthalene,
4,5-dihydroxy-1,2,3,4-tetrahydronaphthalene,
mixtures thereof, and salts thereof as a coupling compound and a developer employed in hair dyeing.

2. The composition as set forth in claim 1, wherein the developer comprises at least one of the compounds of the group consisting of 1,4-diaminobenzene, 2,5-diaminotoluene, 2,5-diaminobenzylalcohol, p-aminophenol and 3-methyl-4-aminophenol.

3. The composition as set forth in claim 1; further comprising at least one of the coupling compounds of the group consisting of alpha-naphthol, 3,4-diaminobenzoic acid, resorcinol, 4-chlororesorcinol, m-aminophenol, 4-oxy-1,2-methylenedioxybenzene and 3-amino-6-methylphenol.

7. The composition as set forth in claim 1; further comprising direct dyes of the group consisting of diamond fuchsin (C.I. 42 510), leather ruby HF (C.I. 42 520) 2-nitro-1,4-diaminobenzene, 2-amino-4-nitrophenol, acid brown 4 (C.I. 14 805), acid blue 135 (C.I. 13 385), disperse red 15 (C.I. 60 710), disperse violet 1 (C.I. 61 100), 1,4,5,8 tetraaminoanthraquinone.

4,321,054

OXIDIZING MEDIUM FOR DYES

Ralph A. Davis, and Randy C. Stauffer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 136,582, Apr. 1, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 244,494

Int. Cl.³ C09B *67/00;* C01B *11/00*

U.S. Cl. 8—621 12 Claims

1. An acidic, aqueous oxidant including ionized bromate, iodate and a soluble molybdenum-containing material.

4,321,055

NAVY DYE MIXTURES AND THEIR USE IN DYEING POLYESTERS

Guenter Hansen, Ludwigshafen; Wolf-Dieter Kermer, Fussgoenheim, and Hans J. Kolbinger, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

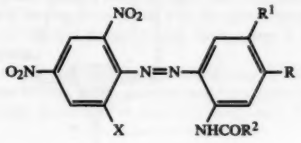
Filed Jan. 6, 1981, Ser. No. 222,923

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004654

Int. Cl.³ C09B *29/00*

U.S. Cl. 8—639 3 Claims

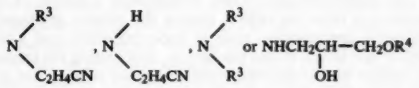
1. A navy dye mixture, containing dyes of the formula I



I

where

X is hydrogen, chlorine or bromine,
R^1 is hydrogen, methoxy, ethoxy or phenoxy,
R^2 is hydrogen, methyl, ethyl, n-propyl or i-propyl and
R is

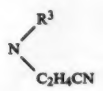


where

R^3 is C_1–C_5-alkyl, allyl, methallyl, crotonyl, prenyl or benzyl,

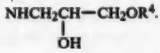
R^4 is unsubstituted or phenyl- or phenoxy-substituted straight-chain or branched C_1–C_8-alkyl which may be interrupted by 1, 2 or 3 O atoms, or is C_3–C_5-alkenyl, unsubstituted or chlorine-, bromine-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenyl or benzyl,

the mixture containing not less than 40% of dyes wherein R is



or NHC_2H_4CN, from 0 to 20% of one or more dyes wherein R is

and from 10 to 60% of one or more dyes wherein R is

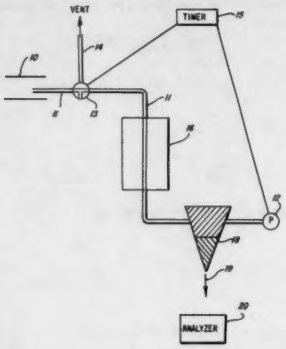


4,321,056

MEASUREMENT OF ENGINE OIL CONSUMPTION

Edward Dimitroff, San Antonio, Tex., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 29, 1980, Ser. No. 220,998
Int. Cl.³ G01N 33/28
U.S. Cl. 23—230 HC 2 Claims



1. A process of measuring the consumption of oil by an internal combustion engine which comprises operating said engine with a lubricating oil containing a known concentration of zinc dialkyldithiophosphate, withdrawing a sample of the exhaust gas from the engine, passing the exhaust gas sample through a condensation zone to condense water and water soluble zinc sulfate in said gas sample, then passing the exhaust gas sample with condensed water and water soluble zinc sulfate to liquid-liquid separating means containing an organic liquid, permitting a phase separation between the organic liquid and water to occur in said separating means, withdrawing an aqueous phase from said separating means and subjecting at least a portion of the aqueous phase to analysis to determine the zinc content thereof.

4,321,057

METHOD FOR QUANTITATIVE ANALYSIS USING OPTICAL FIBERS

Richard G. Buckles, 53 Gellerstrasse, 4052 Basel, Switzerland

Filed Sep. 20, 1979, Ser. No. 76,984
Int. Cl.³ G01N 21/64
U.S. Cl. 23—230 B 22 Claims

1. A method for the quantitative analysis of oxygen in a fluid, said method comprising:

(a) providing a fiber-sheath element including a fiber capable of transmitting electromagnetic energy in the visible and ultraviolet ranges and defining a path for the transmission of said energy, a first oxygen-permeable sheath surrounding said fiber, an oxygen-quenchable dye incorporated into the material forming said fiber or said sheath and means for reflecting said electromagnetic radiation from said sheath into said fiber;

(b) introducing ultraviolet light into one end of said fiber whereby a portion of said ultraviolet light reacts with said fluorescent dye to produce fluorescence and emission of visible light, said emission of visible light being cumulative along a length of said path; and

(c) contacting said fiber-sheath element with said fluid whereby oxygen permeates said element and quenches said fluorescence by reaction with said dye to reduce the visible light emitted from said fiber-sheath element in proportion to the amount of oxygen contained in said fluid.

4,321,058

LATEX COMPOSITION AND METHOD FOR DETERMINING ERYTHROPOIETIN

Tetsuo Tomiyama, Ohizumigakuen, and Takashi Ogura, Higashiyamato, both of Japan, assignors to Seikagaku Kogyoco Ltd., Tokyo, Japan

Filed Jun. 25, 1980, Ser. No. 162,897
Claims priority, application Japan, Jun. 28, 1979, 54/80741
Int. Cl.³ G01N 33/54
U.S. Cl. 23—230 B 8 Claims

1. A composition for determining human erythropoietin, said composition consisting essentially of synthetic polymeric latex particles and hyman erythropoietin coated on the surfaces of said latex particles.

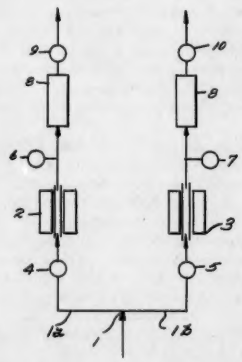
7. A method for determining human erythropoietin in human urine or serum by the microtiter method comprising adding prescribed amounts of antibody to progressively diluted samples of said human urine or serum to neutralize erythropoietin in the samples; adding to the samples a composition consisting essentially of synthetic polymeric latex particles having a specific gravity of about 1.1 to 1.3 and having human erythropoietin coated on the surface of said latex particles; and observing the agglutination reaction caused by said latex and any antibody remaining unneutralized.

4,321,059

PROCESS FOR THE ANALYTICAL DETERMINATION OF HYDROGEN CYANIDE IN GASES

Carl Voigt, Rodenbach; Lothar Schmidt, Alzenau-Albstadt, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,829
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932268
Int. Cl.³ G01N 31/10, 31/00
U.S. Cl. 23—232 R 16 Claims



1. A catalytic process for the analytical determination of hydrogen cyanide in a gas comprising contacting a hydrogen cyanide gas with hydrogen and leading the hydrogen cyanide containing gas and hydrogen at a temperature of 100°–600° C. over an iridium catalyst prepared by reducing hexachloroiridium IV acid on active aluminum oxide and reacting at that temperature the hydrogen cyanide with the hydrogen to form ammonia and methane in the presence of the iridium catalyst, the amount of hydrogen being at least the equivalent amount required to convert all of the hydrogen cyanide to

ammonia and analyzing the gas drawn off for ammonia to provide a determination of the hydrogen cyanide in the hydrogen cyanide gas.

4,321,060

NOVEL PROCESS AND PRODUCT

Rodney L. Sung, Fishkill, and George J. Sidote, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,812
Int. Cl.³ C10L 1/02
U.S. Cl. 44—53 **22 Claims**

1. A composition comprising
(i) a water-soluble alcohol; and
(ii) an effective corrosion-inhibiting amount, as corrosion inhibiting additive, of an amine having the formula

$$(R\text{-}O\text{-}R'')_aNH_{3-a}$$

wherein R contains 6–30 carbon atoms and is selected from the group consisting of alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, and aryl groups and R'' is a divalent hydrocarbon group containing 1–30 carbon atoms and is selected from the group consisting of alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, and aryl groups, and a is an integer 1–3.

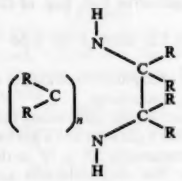
4,321,061

MOTOR FUEL

Robert M. Parlman; Roy C. Lee, and Lyle D. Burns, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 31, 1980, Ser. No. 202,829
Int. Cl.³ C10L 1/22
U.S. Cl. 44—63 **15 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount ranging from about 0.1 to about 10 weight percent, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from compounds represented by the formula



wherein R is hydrogen or an alkyl having from 1–6 carbon atoms, and n is 2 or 3.

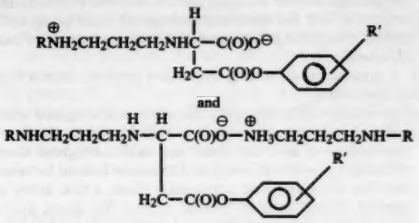
4,321,062

HYDROCARBYL SUBSTITUTED PHENYLASPARTATES OF N-PRIMARY-ALKYL-ALKYLENE DIAMINES AND MOTOR FUEL COMPOSITION CONTAINING SAME

Sheldon Herbstman, Spring Valley, and Peter Dorn, Lagrangeville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,413
Int. Cl.³ C10L 1/22
U.S. Cl. 44—71 **16 Claims**

1. A compound of the formulas:



and

wherein R is a straight chain primary alkyl aliphatic hydrocarbon radical having from about 6 to 30 carbon atoms and R' is an alkyl or alkenyl group having from about 6 to about 30 carbon atoms.

13. A motor fuel composition comprising a mixture of hydrocarbons boiling in the gasoline range and from about 0.0002 to 0.2 weight percent of at least one compound of claim 1.

4,321,063

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1980, Ser. No. 200,295
Int. Cl.³ C10L 1/22
U.S. Cl. 44—74 **11 Claims**

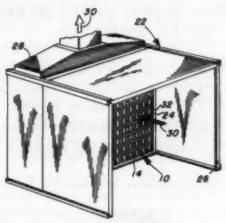
1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount ranging from about 0.5 to about 10 weight percent, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of dibenzylamine and N-methylbenzylamine.

4,321,064

FILTER APPARATUS AND METHOD OF FILTERING

John W. Vargo, 3540 Ridge Rd., Cleveland, Ohio 44102

Filed Sep. 24, 1980, Ser. No. 190,417
Int. Cl.³ B01D 45/06, 45/08; F23J 11/00
U.S. Cl. 55—1 **33 Claims**



1. A filter impingement and deflection medium comprising
a flat sheet,
a corrugated sheet adhered in faced relationship to said flat sheet, the faced relationship of said flat sheet and said corrugated sheet defining a plurality of elongated channels formed between said flat sheet and said corrugated sheet,
a first array of parallel spaced orifices formed in said flat sheet, and
a second array of parallel spaced orifices formed in said corrugated sheet,
the orifices in said first array being disposed laterally in spaced relationship from the orifices in said second array, the orifices in said first array communicating with the orifices in said second array through said channels, the orifices in said flat sheet and corrugated sheet and said

channels having sufficiently large cross sections to permit the passage of fluid through said orifices and channels, the orifices in said flat sheet and corrugated sheet being sufficiently elongated to communicate with a plurality of said channels.

12. A process for separating suspended particles from a fluid stream comprising

(a) providing a filter having a flat sheet, a corrugated sheet adhered in faced relationship to said flat sheet, the faced relationship of said flat sheet and said corrugated sheet defining a plurality of elongated channels formed between said flat sheet and said corrugated sheet, a first array of parallel spaced orifices formed in said flat sheet, and a second array of parallel spaced orifices formed in said corrugated sheet, the orifices in said first array being disposed laterally in spaced relationship from the orifices in said second array, the orifices in said first array communicating with the orifices in said second array through the channels formed between said corrugated sheet and said flat sheet, the orifices in said flat sheet and corrugated sheet and said channels having sufficiently large cross sections to permit the passage of fluid through said orifices and channels, the orifices in said flat sheet and said corrugated sheet being sufficiently elongated to communicate with a plurality of said channels;

(b) projecting said fluid stream against the corrugated sheet of said filter;

(c) accumulating a portion of the particles in said fluid stream on the facing of said corrugated sheet which the fluid stream was projected against;

(d) passing said fluid stream through the orifices of said corrugated sheet;

(e) diverting the flow of said fluid stream into the channels formed between said flat sheet and said corrugated sheet;

(f) accumulating another remaining portion of the particles of said fluid stream in said channels; and

(g) withdrawing said fluid stream from said filter through the orifices in said flat sheet.

4,321,065

LITHIUM ALUMINATES FOR GAS CHROMATOGRAPH COLUMNS

John L. Burba, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1980, Ser. No. 217,613
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **10 Claims**

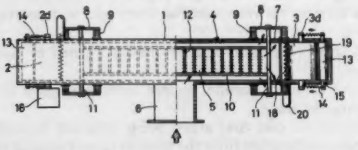
2. In a chromatograph process for separating liquid samples into components for analysis, the use of crystalline $LiX.2Al(OH)_3.nH_2O$, where X is a monovalent, divalent, or trivalent anion and n is an integer having a numerical value in the range of about 1 to about 6, as the packing material in the chromatograph column.

4,321,066

ELECTRIC DUST COLLECTING APPARATUS

Senichi Masuda, No. 605, Nishigahara 1-40-10, Kita-ku, Tokyo-to, Japan

Filed Aug. 28, 1980, Ser. No. 182,030
Int. Cl.³ B03C *3/10*
U.S. Cl. 55—114 **15 Claims**



1. An electric dust collecting apparatus having a casing; an elongated charging electrode extending lengthwise of said casing; a roller rotatably supported at each of the opposite ends of the casing; a driven endless belt-like dust collecting electrode extending between and around said rollers and forming a chamber surrounding said charging electrode; a pair of gas exhaust ports formed in and communicating through said casing; hanger supports for said charging electrode positioned and arranged in each of said gas exhaust ports; said charging electrode being suspended therebetween; electrical insulating means securing said hanger supports to said casing externally thereof; a gas inlet port between and spaced from both of said gas exhaust ports for introducing gas through said casing; said gas inlet port and said gas exhaust ports positioned and arranged with respect to said chamber such that gas will flow through said chamber between said gas inlet port and said exhaust ports.

11. An electric dust collecting apparatus having a casing, a plurality of rollers rotatably supported at each of opposite ends of said casing; a driven endless belt-like dust collecting electrode trained over said rollers to form a plurality of spaced runs extending lengthwise of said casing between said rollers; said runs of said endless electrode forming a plurality of parallel chambers therebetween; a plurality of hanger supports, one adjacent each end of each of said chambers; each of said hanger supports projecting externally of said casing; electrical insulating means supporting each of said hanger supports on said casing externally thereof; a charging electrode mounted to and supported on and between said hanger supports in each of said chambers, a pair of gas exhaust ports, one adjacent each of the opposite ends of said chambers and communicating with each of said chambers; said hanger supports being positioned and arranged in said exhaust gas ports; a gas inlet port between and spaced from both of said gas exhaust ports and communicating with each of said chambers; said gas exhaust ports positioned and arranged with respect to said gas inlet port to provide a path for air to enter, flow through and exhaust from each of said chambers whereby the gas may be caused to flow between the charging and collecting electrodes in each of said chambers.

4,321,067

CORONA-DISCHARGE ELECTRODE SYSTEM

Otto Güpner, Offenbach, and Walter Steuernagel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,152
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949722
Int. Cl.³ B03C *3/08, 3/86*
U.S. Cl. 55—135 **9 Claims**

1. An electrostatic precipitator operable at elevated temperatures and pressures, comprising:

an upwardly inclined elongated housing forming a gas-flow duct provided with a gas inlet and a gas outlet and inclined at an angle of substantially 50° to 70° to the horizontal and defining at least one dust-collection zone therein, said housing being traversed upwardly by gas in a flow direction from said gas inlet to said gas outlet;

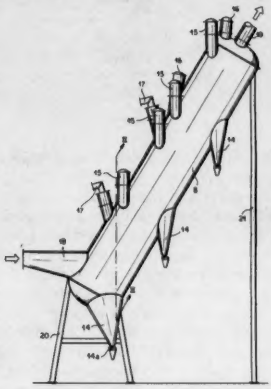
an array of vertical plate-like collecting electrodes in horizontally spaced mutually parallel relationship extending over the length of said at least one zone; and

a corona discharge electrode system in said housing for charging dust particles entrained in a gas traversing said at least one zone for collection of said dust on said collecting electrodes, said system comprising:

a pair of grid like frames disposed at opposite ends of said zone in said housing and spaced apart in the gas flow direction, said frames including an upper frame at a downstream location with respect to said direction and a lower frame at an upstream location with respect to said direction, each of said frames comprising a pair of vertically spaced horizontal main carriers and a plurality of mutually parallel horizontally spaced vertical auxiliary carriers

whereby said upper frame has upper vertical auxiliary carriers and said lower frame has lower vertical auxiliary carriers,

a respective carrier structure for each of said frames and comprising a pair of vertical struts connected to a respective frame, and a pair of inclined struts each connected at its lower end to one of said vertical struts, the inclined struts of said carriers being directed upwardly and outwardly away from said zone with the angle between the inclined struts and the vertical struts being such that the weight and tensile forces of said system are taken up without rigid connection of said frames together,



respective insulators at the upper ends of each of said struts for suspending same on said housing,

a multiplicity of elongated corona discharge electrodes extending between said collecting electrodes parallel to the direction of gas flow and secured to the upper vertical auxiliary carriers, and

a respective weight engaging lower portions of each of said corona discharge electrodes and at said lower vertical auxiliary carriers and forming means for tensioning said corona discharge electrodes against said lower vertical auxiliary carriers.

4,321,068

NON-WELDED DISCHARGE ELECTRODE

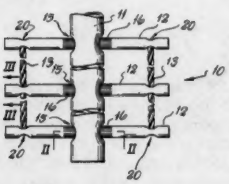
Terence B. F. Cottrell, Walsall, and Dennis C. Paddock, Halesowen, both of England, assignors to Lodge-Cottrell Ltd., Birmingham, England

Filed Sep. 29, 1980, Ser. No. 191,800

Claims priority, application United Kingdom, Oct. 11, 1979, 35404/79

Int. Cl.³ B03C 3/04

U.S. Cl. 55—148 **12 Claims**



1. In a method of assembling an electro-precipitator discharge electrode which comprises an elongated mast, a plurality of cross members fixed to the mast and extending transversely thereof, and at least one elongated discharge element extending between the cross members longitudinally of the mast, the improvement comprising the method steps of:

(a) providing the mast with the cross members secured thereto and with apertures extending transversely through the cross members for the reception of the discharge element;

(b) passing the discharge element through the apertures; and

(c) fixing the discharge element in the apertures by a direct biting engagement of the material of the cross members around the apertures onto the element.

4,321,069

MULTIPLE VESSEL CASCADE GAS ENRICHMENT SYSTEM

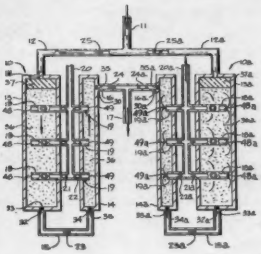
Robert A. Ritter, 5108 Varscliff Rd. NW., Calgary, Alberta, Canada

Filed Dec. 28, 1979, Ser. No. 107,860

Claims priority, application Canada, Oct. 26, 1979, 338533

Int. Cl.³ B01D 53/04

U.S. Cl. 55—161 **35 Claims**



1. A multiple vessel cascade gas enrichment adsorber comprising:

(1) a first stage adsorption vessel provided with a primary gas infeed means, a primary gas outflow means, and a mass of a suitable adsorbent material in said vessel disposed between said primary infeed means and said primary outflow means;

(2) at least one subsequent stage adsorption vessel in cascading interconnection with said first stage adsorption vessel through an associated interstage loop line, each said subsequent stage adsorption vessel or vessels being provided with a first gas inflow means, a first gas outlet means and a mass of a suitable adsorption material disposed between said first inflow means and said first gas outlet means, the first gas outlet means which is associated with the subsequent stage adsorption vessel farthest downstream from the first stage adsorption vessel being provided with an outlet back pressure regulator and non-return valve, each said associated interstage loop line including a back pressure regulator and valve therein;

(3) secondary gas outlet means having valves associated therewith, said secondary gas outlet means leading to secondary gas outlet lines from each of said first stage adsorption vessels and from each of said subsequent stage adsorption vessels or vessels, each said secondary gas outlet means in each of said first stage adsorption vessel and in each said subsequent stage adsorption vessel or vessels including a plurality of vertically spaced-apart horizontally extending collector means, disposed within each said first stage absorption vessel and within each subsequent stage adsorption vessel, each said collector means being provided with a pluraity of dispersed gas inlet ports;

(4) diaphragm valves associated with each said collector means; and

(5) means for actuating said diaphragm valves for alternate cylical operation for a production period wherein said

diaphragm valves are closed to provide a long adsorption path from said primary infeed means to said primary outflow means, and an evacuation period wherein said diaphragm valves are opened, to provide a short desorption path through said secondary outlet means; wherein

(6) the individual volumetric size of said subsequent stage vessel or vessels is smaller than the volumetric size of said first stage vessel.

19. A multiple vessel cascade gas enrichment adsorber system comprising:

(A) at least two interlinked multiple vessel cascade gas enrichment adsorber sets, each said adsorber set comprising

(1) a first stage adsorption vessel provided with a primary gas infeed means, a primary gas outflow means, and a mass of a suitable adsorbent material in said vessel disposed between said primary infeed means and said primary outflow means,

(2) at least one subsequent stage adsorption vessel in cascading interconnection with said first stage adsorption vessel through an associated interstage loop line, each said subsequent stage adsorption vessel being provided with a first gas inflow means, a first gas outlet means, and a mass of a suitable adsorption material disposed between said first inflow means and said first gas outlet means, the first gas outlet means which is associated with the subsequent stage adsorption vessel being provided with an outlet back pressure regulator and non-return valve, each said associated interstage loop line including a back pressure regulator and valve therein,

(3) secondary gas outlet means having valves associated therewith, said secondary gas outlet means leading to secondary gas outlet lines from each of said first stage adsorption vessels and from each of said subsequent stage adsorption vessels, each said secondary gas outlet means in each of said first stage adsorption vessel and said subsequent stage adsorption vessel including a plurality of vertically spaced-apart horizontally extending collector means, disposed within each said first stage adsorption vessel and within each subsequent stage adsorption vessel, each said collector means being provided with a plurality of dispersed gas inlet ports,

(4) diaphragm valves associated with each said collector means, and

(5) means for actuating said diaphragm valves for alternate cyclical operation for a production period wherein said diaphragm valves are closed to provide a long adsorption path from said primary infeed means to said primary outflow means, and an evacuation period wherein said diaphragm valves are opened, to provide a short desorption path through said secondary outlet means, wherein

(6) the individual volumetric size of said subsequent stage vessel or vessels is smaller than the volumetric size of said first stage vessel,

(7) a drier vessel interconnected between said gas infeed line and said first stage adsorption vessel and also connected to said collector means, and

(8) a product gas storage vessel connected to the product outflow line;

(B) means for cyclically feeding a gaseous mixture to a selected one of said adsorber set of vessels;

(C) means for cyclically withdrawing enriched gas from a selected one of said adsorber set of vessels; and

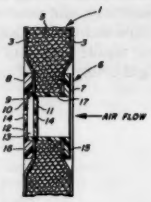
(D) control means for cyclically operating one said adsorber set of vessels in its adsorption mode and for operating another said adsorber set of vessels in its regeneration mode.

4,321,070

WHISTLE TO SIGNAL CLOGGED AIR FILTER

James D. Bede, Bay Village, Ohio, assignor to Bede Industries, Inc., Cleveland, Ohio

Filed Aug. 22, 1980, Ser. No. 180,338
Int. Cl.[3] B01D *46/00*
U.S. Cl. 55—274 5 Claims



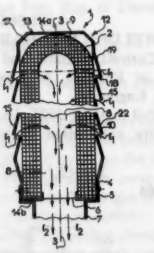
1. A whistle to signal a predetermined clogged condition of an air filter comprising a first part having a flange adapted to engage a minute portion of the upstream side of a filter and a cylindrical extension from said flange adapted to extend through the filter medium; and a second part of disc-like form having snug removable interengagement with the downstream end portion of said extension and constituting a flange adapted to engage a minute portion of the downstream side of the filter and to compress the filter medium between said flanges; said parts defining therebetween a cylindrical chamber including axially spaced apart end walls each having a central orifice therethrough operative in conjunction with said chamber to emit an audible signal upon predetermined increase in pressure drop across the filter.

4,321,071

FILTER FOR REMOVING DUST FROM A GASEOUS FLUID

Jean Claude Sobole, Ruffey les Echirey, France, assignor to Societe Bourguignonne de Mecanique, France

Filed Apr. 8, 1980, Ser. No. 138,301
Claims priority, application France, Apr. 10, 1979, 79 09025
Int. Cl.[3] B01D *50/00*
U.S. Cl. 55—320 10 Claims



1. A filter for removing dust from a gaseous fluid such as air, comprising a case having a side wall with fluid inlet means in said side wall, and an outlet, filter means in said case between said inlet means and said outlet so that, in passing from said inlet means to said outlet, fluid must pass through said filter means, said filter means having an outer face facing said side wall;

said fluid inlet means comprising inclined baffle plates defining inlet openings of said case disposed at approximately 90° to said outer face of said filter means, and inlet passages leading from said inlet openings to said outer face of

said filter means, said inlet passages being inclined at an acute angle to said outer face of said filter means in a direction away from said outlet,

whereby fluid being filtered initially passes through a first section of said filter medium which provides the shortest path from said inlet openings to said outlet and, as this section becomes clogged with retained dust, said fluid passes through an adjacent section of said filter means.

4,321,072

METHOD FOR AUTOMATIC CENTERING OF AN OPTICAL FIBER WITHIN A PRIMARY PROTECTIVE CLADDING AND A DEVICE EMPLOYED FOR CARRYING OUT SAID METHOD

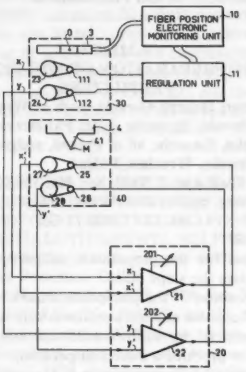
Jacques Dubos; Michel Faure, and Yves Lumineau, all of Paris, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Nov. 14, 1980, Ser. No. 206,830

Claims priority, application France, Nov. 16, 1979, 79 28307

Int. Cl.³ C03C *25/02*; G01B *9/02*

U.S. Cl. 65—3.11 **5 Claims**



1. A method for automatic centering of an optical fiber within a protective cladding while drawing of said fiber is in progress, said cladding being deposited in a coating operation performed by means of a device through which the fiber passes after withdrawal from a preform, in which the position of the coating device is controlled in dependence on the position of the fiber with respect to a point of origin, wherein the point of origin is determined by first optoelectronic means for controlling the centering of the fiber within its cladding, wherein second optoelectronic means serve to measure the coordinates of the displacement of the fiber with respect to said point of origin and wherein third electronic means and electromechanical means utilize said coordinates for the purpose of displacing the coating device and thus centering the fiber.

4,321,073

METHOD AND APPARATUS FOR FORMING METAL COATING ON GLASS FIBER

George R. Blair, Culver City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 15, 1980, Ser. No. 197,367

Int. Cl.³ C03C *25/02*

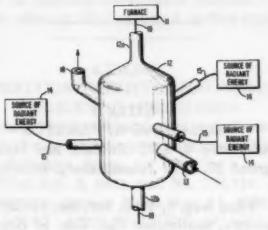
U.S. Cl. 65—3.31 **9 Claims**

1. Apparatus for providing a metal coating on a glass fiber including silica as its major constituent comprising:

(a) a chamber adapted to permit passing therethrough of said glass fiber;

(b) means for introducing into said chamber a metal-containing compound capable of dissociation to form elemental metal and a gaseous product;

(c) a source of radiant energy emitting radiation at a wavelength greater than about 5 μm to heat at least the surface of said glass fiber to a temperature capable of dissociating said metal-containing compound;



(d) means for introducing said radiant energy to at least a portion of only said glass fiber in said chamber, said means comprising at least one infrared-transmitting fiber; and

(e) means for removing any non-dissociated compound and gaseous product.

4,321,074

METHOD AND APPARATUS FOR MANUFACTURING GLASS FIBERS

H. I. Glaser, Granville; F. D. Meyers, Sylvania; Elmer P. Rieser, Pickerington, and Thomas K. Thompson, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 952,039, Oct. 16, 1978, Pat. No. 4,222,757. This application Mar. 20, 1980, Ser. No. 132,247

The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—12 **7 Claims**

1. Apparatus for forming glass fibers comprising:

(a) means comprising a stream feeder for flowing streams of glass from the stream feeder through orificed projections depending from the feeder floor, the feeder floor having from about 25 orificed projections per square inch to about 150 orificed projections per square inch, the streams of glass forming cones of glass at the discharge end of the orificed projections during attenuation of fibers from the streams of glass and the orificed projections being in close compacted relation to retain a layer of gas adjacent the feeder floor;

(b) means for directing gas upwardly into contact with the cones of glass at a velocity and in an amount to convey from the cones of glass sufficient heat to render the glass

of the cones attenuable to fibers without completely removing the layer of gas in the region of the orificed projections; and

(c) means for attenuating fibers from the streams of molten glass.

4,321,075

SKIMMING APPARATUS

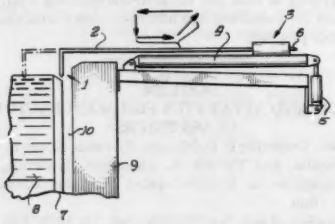
Emil Ilk, Ahornweg 4, 8372 Zwiesel, and Helmut Sorg, Im Himbeergrund 27, 8752 Johannesberg, both of Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,380

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932282

Int. Cl.³ C03B 5/2

U.S. Cl. 65—27 3 Claims



1. An apparatus for skimming the surface of molten glass in a tank to produce a portion thereof, free of contamination, comprising: a scraper arm; a substantially horizontally disposed strut connected to the scraper arm; a substantially horizontal first cylinder means connected to the strut for effecting horizontal movement of the scraper arm above the glass surface to position same, means pivotally mounting an end of said first cylinder means adjacent the tank, a second cylinder means joined to the other end of said first cylinder means for pivoting said first cylinder means about said pivot means to effect vertical movement to immerse the arm into or lift the arm from the melt; said first cylinder means effecting horizontal movement of the arm while immersed to effect skimming, said first and second cylinders effecting simultaneous vertical and horizontal movement of the arm to retract same from the tank.

3. A method of skimming contaminants from a surface of glass in a tank by a scraper arm movable by a first cylinder means in a horizontal direction, and a second cylinder means connected to a remote end of the first cylinder means for pivoting the latter about an end thereof adjacent the glass tank, said method comprising the steps of:

providing a scraper arm and substantially horizontally disposed strut connected thereto;

lowering a remote end of the strut and cylinder means to raise the scraper arm above the surfaces and advancing same horizontally;

raising the remote end of the first cylinder means and the strut to lower the scraper arm onto the surface of the molten glass mass until it is slightly immersed into the latter;

retracting the scraper arm towards an edge of glass tank; and

upon reaching a marginal portion of the glass tank raising the scraper arm by lowering the remote end of said cylinder means and strut while the scraper arm is simultaneously further retracted across the edge of the glass tank.

4,321,076

MEDIA FOR STIMULATING GROWTH IN FOLIAGE PLANTS

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 109,794, Jan. 7, 1980, Pat. No. 4,274,860, which is a continuation-in-part of Ser. No. 924,146, Jul. 13, 1978, abandoned. This application Oct. 29, 1980, Ser. No. 201,923

Int. Cl.³ C05F 11/02

U.S. Cl. 71—24 4 Claims

1. In a conventional potting media for stimulating growth of foliage plants, the improvement which comprises, the presence of from 0.1 percent to 10 percent by volume of a humate, said humate being one which has been recovered from a rutile sand deposit and one which has in its composition a carbon to hydrogen ratio (weight to weight) of from 9.5–17.5:1.0; a carbon to oxygen ratio of 1.0–2.0:1.0; an aluminum content of 2.8 to 8.4 percent by weight; a titanium content of 0.5 to 1.5 percent by weight and a calcium content of less than 0.5 percent by weight; said humate being present in the potting media in an amount such that the potting media is effective to stimulate the growth of foliage plants selected from the group consisting of Calethea, Chamaedorea and Philodendron.

4,321,077

METHOD OF PREPARATION OF MULTICOMPONENT FERTILIZERS

Jerzy Schroeder; Henryk Gorecki, both of Wroclaw; Mieczyslaw Lewandowski, Szczecin; Adam Pawelczyk, Wroclaw, and Antoni Kuzko, Szczecin, all of Poland, assignors to Politechnika Wroclawska, Wroclaw, Poland

Filed Apr. 2, 1980, Ser. No. 136,527

Claims priority, application Poland, Jun. 27, 1979, 216704

Int. Cl.³ C05B 11/08

U.S. Cl. 71—40 3 Claims

1. A process for the preparation of phosphate fertilizers which comprises the steps of:

(a) decomposition of the phosphate mineral by wet milling of said phosphate mineral simultaneously with the wetting of said mineral by sulfuric acid and ammonium sulfate solution to produce a milled suspension;

(b) completing the decomposition of any residual phosphate by transferring said milled suspension to crystallizing vessels;

(c) crystallizing the phosphate fertilizer in said vessels;

(d) filtering the precipitated gypsum and residual pulp from the ammonium sulfate solution;

(e) washing said precipitate in counter current fashion with a portion of the ammonium sulfate filtrate;

(f) utilizing the remaining portion of the ammonium sulfate solution for preparing the phosphate fertilizer;

(g) recycling the ammonium sulfate solution to said wet milling decomposition step (a).

4,321,078

SLOW RELEASE FERTILIZER COMPOSITION

Michael A. Michaud, Rte. 2, Box 26, Bastrop, La. 71220

Filed Jun. 30, 1980, Ser. No. 164,149

Int. Cl.³ C05B 21/00

U.S. Cl. 71—44 20 Claims

1. A slow release fertilizer composition consisting essentially of

	% by Weight
(a) Primary Nutrients	
$NH_4CaPO_4 \cdot 7H_2O$	20–80
$CaHPO_4$	0–60
$CaCO_3 \cdot MgCO_3$	7–16
K_2SiO_3	5–30
$CaSO_4$	up to 25
(b) Micro-Nutrients	

-continued

	% by Weight
Fe_2O_3	0.02–0.5
MnO	0.006–0.2
ZnO	0.006–0.04
CuO	0.0025–0.02
BPO_4	0.03–0.2

4,321,079

AQUEOUS SULFUR DISPERSION HAVING REDUCED CORROSIVE ACTIVITY TOWARD FERROUS METAL

Louis E. Ott, Oswego, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 969,487, Dec. 14, 1978, Pat. No. 4,256,691. This application May 21, 1980, Ser. No. 151,882
Int. Cl.³ C05C 3/00
U.S. Cl. 71—61 12 Claims

1. A sulfur dispersion comprising a dispersion of finely divided elemental sulfur in an aqueous solution of ammonia and at least one metal compound, wherein the amount of elemental sulfur is from about 1 to about 70 weight percent based on the total dispersion, the metal compound is selected from the group consisting of soluble zinc and magnesium compounds, the moles of ammonia per gram-atom of metal from the metal compound is from about 0.1 to about 200, and the atomic ratio of metal to sulfur is from about 0.0002 to about 0.1.

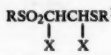
4,321,080

ALGICIDAL AND FUNGICIDAL 1-HALO-2-SUBSTITUTED-THIOETHYL SULFONES, 2-SUBSTITUTED-THIOVINYL SULFONES, AND 1,2-DIHALOTHIOETHYL SULFONES

Philip S. Magee, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

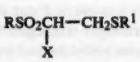
Division of Ser. No. 60,114, Jul. 23, 1979, Pat. No. 4,255,451, which is a division of Ser. No. 912,778, Jul. 23, 1979, Pat. No. 4,196,152, which is a continuation-in-part of Ser. No. 814,013, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 657,677, Feb. 2, 1976, abandoned. This application Aug. 11, 1980, Ser. No. 176,898
Int. Cl.³ A01N 41/10
U.S. Cl. 71—67 19 Claims

1. A method for the control of algae which comprises applying thereto an algicidally effective amount of a compound of the formula



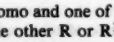
wherein X is chloro or bromo, and one of R or R^1 is alkyl of 1 to 6 carbon atoms, and the other R or R^1 group is phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

2. A method for the control of algae which comprises applying thereto an algicidally effective amount of a compound of the formula



wherein X is chloro or bromo and one of R or R^1 is alkyl of 1 to 6 carbon atoms, and the other R or R^1 group is phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

3. A method for the control of algae which comprises applying thereto an algicidally effective amount of a compound of the formula



wherein one of R or R^1 is alkyl of 1 to 6 carbon atoms, and the other R or R^1 group is phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

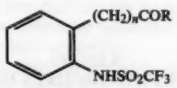
4,321,081

ORTHO-(TRIFLUOROMETHYLSULFONAMIDO)BENZAMIDES AS HERBICIDES

Hiroyuki Konishi; Shunichi Hashimoto, and Hiromichi Oshio, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 3, 1981, Ser. No. 250,724
Claims priority, application Japan, Apr. 11, 1980, 55-48252
Int. Cl.³ A01N 9/16; C07C 143/74
U.S. Cl. 71—88 18 Claims

1. A compound of the formula:



wherein R is C_1–C_4 alkylamino, C_3–C_4 alkenylamino, C_3–C_4 alkynylamino, di(C_1–C_4)alkylamino, di(C_3–C_4)alkenylamino, di(C_3–C_4)alkynylamino, C_1–C_4 alkyl(C_3–C_4)alkenylamino, C_1–C_4 alkyl(C_3–C_4)alkynylamino, C_1–C_4 alkoxyamino, C_1–C_4 alkyl(C_1–C_4)alkoxyamino, C_1–C_4 alkylphenylamino, morpholino, thiomorpholino, C_1–C_4 alkylmorpholino, di(C_1–C_4)alkylmorpholino, pyrrolidino, C_1–C_4 alkylpyrrolidino, piperidino, C_1–C_4 alkylpiperidino, hexamethyleneimino or tetrahydropyridino and n is an integer of 0 or 1, or a salt thereof.

15. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim 1 to the area where the weeds grow or will grow.

4,321,082

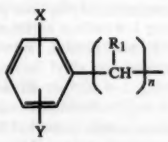
SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

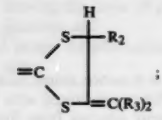
Division of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Jul. 21, 1980, Ser. No. 170,505
Int. Cl.³ A01N 43/02
U.S. Cl. 71—90 47 Claims

1. A method of reducing injury to crop plants due to the application thereto of acetanilide herbicides which comprises applying to the plant locus a safening effective amount of a compound having the formula

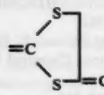
or an agriculturally acceptable acid addition salt thereof, wherein R is hydrogen, or



R_1 is hydrogen or lower alkyl; X and Y independently equal hydrogen, lower alkyl, lower alkoxy or halogen; n is 0, 1, 2 or 3; A is



R_2 is hydrogen or methyl; R_3 is hydrogen or halogen; provided that when n is 1 and A is



R_1 cannot equal ethyl.

4,321,083

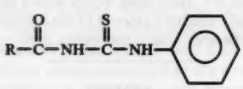
N-ACYL-PHENYL-THIOUREA HERBICIDAL ANTIDOTES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 21, 1980, Ser. No. 142,531
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—99 **4 Claims**

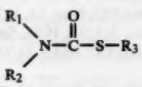
1. A herbicidal composition comprising

(a) a non-phytotoxic antidotally effective amount of a compound of the formula



in which R is alkyl having 1–4 carbon atoms; and

(b) a herbicidally effective amount of a thiolcarbamate herbicide of the formula



in which

R_1 is selected from the group consisting of alkyl having 1–6 carbon atoms and alkenyl having 2–6 carbon atoms;

R_2 is selected from the group consisting of alkyl having 1–6 carbon atoms, alkenyl having 2–6 carbon atoms, cyclohexyl and phenyl; or

R_1 and R_2 together form an alkylene group having 5–10 carbon atoms; and

R_3 is selected from the group consisting of alkyl having 1–6 carbon atoms, haloalkyl having 1–6 carbon atoms, cycloalkyl having 5–10 carbon atoms, phenyl, substituted phenyl, wherein the substituents are alkyl having 1–4 carbon atoms, haloalkyl having 1–4 carbon atoms, and halo, benzyl and substituted benzyl, wherein the substituents are alkyl having 1–4 carbon atoms, haloalkyl having 1–4 carbon atoms, and halo; wherein said antidote compound is present in an amount ranging between about 0.001 to 30 parts by weight for each part by weight of the thiolcarbamate herbicidal compound.

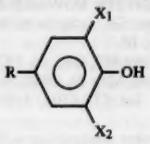
4,321,084

CERTAIN HALOGENATED PHENOLS AS ANTIDOTES FOR THIOCARBAMATE HERBICIDES

Victor M. Thomas, and Martin D. Mahoney, both of San Jose, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 23, 1977, Ser. No. 836,129
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—100 **31 Claims**

1. A herbicidal composition comprising a thiocarbamate herbicide and a non-phytotoxic antidotally effective amount of a halogenated phenol of the formula



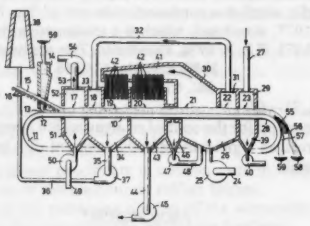
wherein each of X_1 and X_2 is halogen and R is selected from the group consisting of lower alkyl, carbalkoxy, carboxy, formyl, hydroxymethyl, trifluoromethyl, cyano and hydroxyiminomethyl; said phenol being antidotally active with said thiocarbamate herbicide compound.

4,321,085

METHOD OF SINTERING PELLETS

Roland Drugge, Malmberget, Sweden, assignor to Loussavaara-Kiirunavaara Aktiebolag, Stockholm, Sweden

Filed Jan. 23, 1980, Ser. No. 114,693
Claims priority, application Sweden, Feb. 6, 1979, 7901052
Int. Cl.³ C22B *1/20*
U.S. Cl. 75—5 **6 Claims**



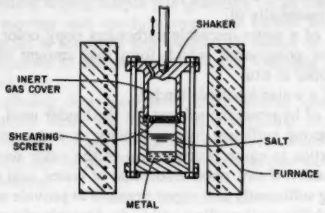
1. A method of sintering green iron ore pellets, comprising the steps of drying, pre-heating, firing and cooling said pellets, in which at least the drying and pre-heating steps are carried out with said pellets resting in the form of a bed on an endless gas-permeable conveyor, and in which at least a first part of the drying operation is effected with a gas passing upwardly through the conveyor and the pellet bed, while subsequent temperature-increasing treatment steps carried out on the conveyor are effected with a hot gas passing downwardly through the pellet bed and the conveyor, said at least first part of the drying operation is carried out with heat stored in the conveyor, in a hearth-layer arranged on said conveyor between the latter and the pellet bed or in the conveyor and the hearth-layer by using a drying gas comprising air having, when passing upwardly into the conveyor at the first part of where said drying operation is effected, a temperature of at most 100° C. and which air during its passage through the conveyor, the hearth-layer or the conveyor and the hearth-layer is heated thereby to the temperature necessary to effect said at least first part of the drying operation.

4,321,086

PREPARATION OF MICRON SIZED METAL DROPLETS

John H. Perepezko, Madison, Wis.; Don H. Rasmussen, Canton, N.Y., and Carl R. Loper, Jr., Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 26, 1980, Ser. No. 190,948
Int. Cl.³ B22D *23/08*
U.S. Cl. 75—0.5 C 15 Claims



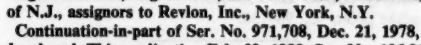
1. The method of preparing micron sized droplets of metals having a high melting point, such as superalloys having a melting point above 2100°–2700° F., comprising reducing the metal to micron sized particles while at a temperature above its melting point in the carrier to emulsify the metal as fine micron sized droplets in the fluid or gas, and exposing the metal, while in the emulsified state in said fluid or gas, to a reaction medium to form a protective layer on the surfaces of the droplets for protection of the droplets against agglomeration, and cooling the metal droplets to their solidified state to produce separated micron sized particles of the metal.

4,321,087

PROCESS FOR MAKING METALLIC LEAFING PIGMENTS

Sol Levine, Morristown; Melvin E. Kamen, Woodcliff Lake; August DeFazio, Englishtown, and Peter Cueli, Somerville, all of N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 971,708, Dec. 21, 1978, abandoned. This application Feb. 29, 1980, Ser. No. 126,011
Int. Cl.³ B22F *9/00*
U.S. Cl. 75—0.5 A 13 Claims



1. A continuous process for preparing finely divided metal particles comprising the steps of:

(a) Applying a release coating onto at least one side of a continuous carrier sheet in an amount of from 0.75 to 1.50 lbs. of said release coating per ream per side of said carrier sheet,

(b) depositing in the form of a thin film, a metal selected from the group consisting of aluminum, chromium, copper, steel, silver and gold, in an amount of from 350 to 450 angstroms thickness directly onto said release coating,

(c) passing said carrier sheet with said release coating and said film of said metal through a solvent for solubiling said release coating but which is non-reactive with said metal,

(d) removing said film of said metal from said carrier sheet in a particulate form to produce the metal particles substantially free of said release coating, and collecting the metal particles in a non-reactive solvent which is non-reactive with said metal.

(e) concentrating the metal particles, and

(f) breaking the metal particles into pigment particles having a particle size diameter between about 25 and 50 microns.

4,321,088

PROCESS FOR TREATING PIG IRON MELTS AND STEEL MELTS OR ALLOYS

Georg Boehm, Heddesheim, and Engelbert Hillenbrand, Heppenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 2, 1979, Ser. No. 35,318
Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820555
Int. Cl.³ C21C *5/34, 7/04*
U.S. Cl. 75—59 8 Claims

1. A refining and treatment process for substantially removing carbon and other oxidizable impurities from ferrous melts in a metallurgical vessel, comprising

a step (a) wherein a reactant consisting essentially of carbon dioxide is blown into the melt in an amount of from about 0.06 to about 0.40 moles of CO_2 for each mole of iron.

4,321,089

PROCESS FOR THE RECOVERY OF MOLYBDENUM AND RHENIUM FROM THEIR SULFIDE ORES

Paul R. Kruesi, Golden, and Veryl H. Frahm, Jr., Boulder, both of Colo., assignors to Cato Research Corporation, Wheat Ridge, Colo.

Filed Jun. 11, 1980, Ser. No. 158,449
Int. Cl.³ C22B *1/11, 34/34, 34/00*
U.S. Cl. 75—84.5 20 Claims

1. A process for the recovery of a metal selected from the group consisting of molybdenum and rhenium from their sulfide ores which comprises subjecting the ores to microwave energy in the presence of oxygen or chlorine to selectively heat the sulfides to convert the sulfides to oxides or chlorides, respectively, and recovering the metals from the formed oxides or chlorides.

4,321,090

MAGNETIC AMORPHOUS METAL ALLOYS

Amitava Datta, Mendham, and Nicholas J. DeCristofaro, Chatham, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 6, 1980, Ser. No. 127,714
Int. Cl.³ C22C *33/00*
U.S. Cl. 75—123 B 5 Claims

1. A metal alloy which is at least 90 percent amorphous consisting essentially of a composition having the formula $Fe_aCo_bB_cSi_d$, where "a", "b", "c" and "d" are atomic percentages ranging from about 64.0 to 80.0, 7.0 to 20.0, 13.0 to 15.0 and greater than zero to 1.5, respectively, with the proviso that the sum of "a", "b", "c" and "d" equals 100.

4,321,091

METHOD FOR PRODUCING HOT FORGED MATERIAL FROM POWDER

Yoshinobu Takeda; Nobuhito Kuroishi, and Susumu Noji, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 19, 1979, Ser. No. 76,947

Claims priority, application Japan, Sep. 27, 1978, 53-117897; Sep. 27, 1978, 53-117898

Int. Cl.³ B22F *3/00*

U.S. Cl. 75—213 3 Claims

1. A method for producing a powder forged material comprising 1.4~3.5% Si, 0.2~0.9% Mn and 1.0~2.0% C by weight, the remainder substantially consisting of iron, said method consisting essentially of:

(a) pulverizing the swarf of an FCD cast iron mother material and separating and removing graphite microparticles from the mother material to produce a powder body of said mother material having a carbon content of 1.0~2.5%;

(b) preforming said powder body having the reduced carbon content to a density of 80~85% of the specific gravity of the mother material and applying a lubricant to the preformed body;

(c) heating the thus-treated preformed body at a temperature above the melting point of the mother material and below 1300° C. for 10~900 seconds in a non-carburizing atmosphere and thereafter cooling the preformed body until the temperature of the surface is lowered to 1000°~1100° C. and thereafter forging the preformed body in a die under such pressure conditions that the specific gravity is 100~110% of that of said mother material; and

(d) subjecting the forged body to a diffusion treatment by heating it above the austenitizing temperature.

4,321,092

PRESSURE-SENSITIVE DUPLICATING MATERIAL

Manuel Cespon, Vienna, Austria, assignor to Kores Holding Zug AG, Zug, Switzerland

Continuation of Ser. No. 887,519, Mar. 17, 1978, abandoned, which is a continuation of Ser. No. 688,759, May 21, 1976, abandoned, and Ser. No. 485,434, Jul. 3, 1974, abandoned. This application Mar. 10, 1980, Ser. No. 128,806

Claims priority, application Austria, Jul. 27, 1973, 6656/73; Jul. 27, 1973, 6657/73; Sep. 10, 1973, 7806/73

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—21 10 Claims

1. A pressure-sensitive transfer material comprising in combination:

a color-accepting composition comprising as the essential color acceptor, a chloride of a metal having an atomic weight of 50 to 66, and a urea compound selected from the group consisting of urea, thiourea and diphenylthiourea, the weight ratio of said metal chloride to said urea compound being from about 5:1 to 1:1, mixed with and bound directly to a first binder;

a color-forming composition comprising as the essential color-former an initial metal chloride-developable dye precursor combined with and embedded directly in a second binder, said dye precursor being capable of undergoing a color change and forming a dye upon reaction with said metal chloride color acceptor, said metal chloride and said urea compound being present in said color-accepting composition in an amount effective to activate and react with said initial metal chloride-developable dye precursor to produce a color change upon pressure contact therewith, both compositions being mixed directly with said respective binders and present therein each in a substantially dry solid state; and

carrier means operable for supporting at least one layer of said color acceptor and color-forming compositions.

4,321,093

MOISTURE-SET COLOR DEVELOPER INK

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Apr. 4, 1980, Ser. No. 137,505

Int. Cl.³ C09D *11/04, 11/08, 11/14*

U.S. Cl. 106—21 20 Claims

1. A moisture-set color developer ink formulation, capable of being applied by a printing press with rollers and a fountain, consisting essentially of:

10–40% of a water-insoluble carbonless copy color developer or compounds which form said amount of color developer in situ;

0–5% of a water-insoluble binder;

30–60% of hygroscopic solvent for the binder used, if any, and having sufficient hygroscopicity or water solubility properties to cause precipitation of the color developer and binder, if any, upon absorption of water, said solvent having sufficiently low vapor pressure to provide substantial stability on the rollers and in the fountain of a printing press at room temperature; and

0–35% of clay or other filler, all percentages are by weight of the total composition.

4,321,094

NEWS INK

Colin B. Batt, Acton; David Daffern, Agincourt, and Paramanda Gupta, Rexdale, all of Canada, assignors to Canada Printing Ink, Islington, Canada

Filed Oct. 6, 1980, Ser. No. 194,436

Claims priority, application Canada, May 15, 1980, 352055

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—32 9 Claims

1. A news ink of low misting properties comprising a dispersion of a news ink pigment in a hydrocarbon oil, wherein the oil has the following physical properties:

Colour: water-white
Aromatic content: zero
Refractive index: 1.467–1.480
Specific gravity: 0.850–0.879
Viscosity, cSt/40° C.: 9.38–439.7
Aniline point, °C.: 96–138.

4,321,095

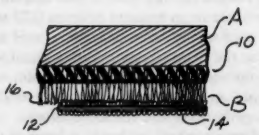
SCRUBBING METHOD AND APPARATUS USING VIBRATING TERRY CLOTH

Dorothy P. Argo, P.O. Box 2747, Spartanburg, S.C. 29304, and Anne A. Sanders, 244 Greengate La., Spartanburg, S.C. 29302

Filed Oct. 31, 1980, Ser. No. 202,602

Int. Cl.³ B08B *1/00*

U.S. Cl. 134—6 9 Claims



1. A method of cleaning carpet and the like surface, comprising:

(a) supplying a piece of terry cloth including terry loops and fabric;

(b) moistening said terry cloth with a cleaning sclution;

(c) providing a vibrating machine having a vibrating drive plate movable in short rapid oscillations producing a vibrating motion and effect;

(d) providing a plurality of semi-rigid generally elastic

barbed fingers affixed to a bottom of said drive plate adapted for engaging said terry cloth;

(e) placing said terry cloth upon said carpet to be cleaned;

(f) engaging said barbed fingers and said terry cloth;

(g) imparting a scrubbing motion to said terry cloth by means of said barbed fingers engaging said loops and fabric of said terry cloth and massaging said carpet pile through said terry cloth as a multitude of fingers, said motion wiping carpet pile generally on all sides thereof;

(h) moving said machine over said carpet whereby said carpet is scrubbed and cleaned by means of the motion imparted to the terry cloth by said vibrating drive plate; and

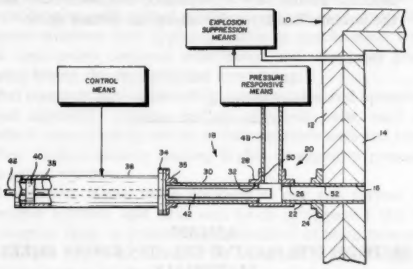
(i) utilizing short-loop terry cloth having loops of sufficiently short lengths that said vibrating motion is not absorbed by said loops but is directly imparted to said cloth and carpet pile for effective machine movement and cleaning.

4,321,096

APPARATUS AND METHOD FOR CLEANING AN EXPLOSION SENSING PORT

Robert R. Dobbin, Webster, N.Y., assignor to John B. Pike & Son, Inc., Rochester, N.Y.

Filed Dec. 16, 1980, Ser. No. 217,086
Int. Cl.³ B08B 9/02
U.S. Cl. 134—8 **14 Claims**



11. A method for cleaning an explosion sensing port in the wall of a chamber without blocking said port, in which said chamber is coupled to an explosion suppression means, and has pressure responsive means coupled to said explosion sensing port for actuating said explosion suppression means whenever the fluid pressure through said sensing port reaches a predetermined value due to an explosion within the chamber, comprising the steps of:

fluidly connecting said sensing port to said pressure responsive means by a duct means;

arranging a bar within a portion of said duct means for movement through said sensing port for cleaning out any material that has accumulated in said sensing port, said bar having a cross-sectional area throughout its length that is less than the cross-sectional area of said sensing port to allow fluid pressure to pass through said sensing port while it is being cleaned; and

intermittently moving said bar through said sensing port.

4,321,097

BLADE FABRICATING PROCESS

Russell H. Kerr, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

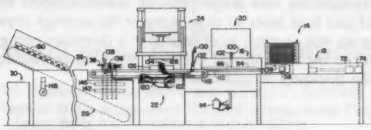
Filed May 14, 1979, Ser. No. 38,385
Int. Cl.³ C21D 7/14
U.S. Cl. 148—12.4 **26 Claims**

1. A method of fabricating a mower blade from a relatively thin elongated metal blank having upper and lower flat surfaces and laterally outward edge portions, said method including the steps of:

moving the blank along a path adjacent an inductor;

supporting the blank with one of the flat surfaces immediately adjacent the inductor;

inductively heating the blank throughout its thickness to a temperature above the curie temperature of the metal by



applying a time-varying magnetic field to said one flat surface only of the blank and inducing current flow in the blank;

hot-forming the heated blank to the desired shape of the mower blade before the blank cools below a preselected temperature; and

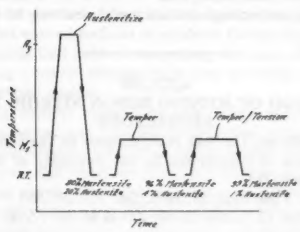
hardening the formed blade, said step of hardening including depositing the blade edgewise in a quench solution.

4,321,098

CONTINUOUS HARDENING OF HIGH SPEED STEEL

Howard A. Hayden, 2318 Dorchester, Troy, Mich. 48084

Continuation of Ser. No. 1,429, Jan. 8, 1979, abandoned. This application Apr. 9, 1980, Ser. No. 138,677
Int. Cl.³ C21D 9/52
U.S. Cl. 148—14 **13 Claims**



1. A method of continuously hardening and straightening high speed steel wire comprising sequentially subjecting an annealed high speed steel wire portion to steps of: austenitizing and quenching; first tempering and first cooling; second tempering and second cooling, said second tempering and second cooling being carried out while simultaneously applying a tensioning force of at least 10,000 lbs. per square inch to said wire portion.

4,321,099

METHOD OF FABRICATING SCHOTTKY BARRIER SOLAR CELL

Robert A. Frosch, Administrator of The National Aeronautics and Space Administration, with respect to an invention of; Richard J. Stirn, La Canada, and Yea-Chuan M. Yeh, Santa Monica, both of Calif.

Division of Ser. No. 93,714, Nov. 13, 1979, Pat. No. 4,278,830, which is a continuation-in-part of Ser. No. 837,513, Sep. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 683,073, May 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,430, Jul. 21, 1975, abandoned. This application Jan. 16, 1981, Ser. No. 225,501
Int. Cl.³ H01L 31/18
U.S. Cl. 148—175 **7 Claims**

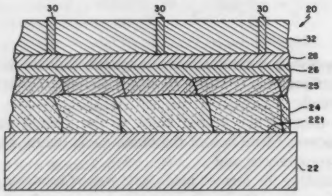
1. A method of fabricating a Schottky barrier GaAs solar

cell for converting incident light energy to electrical energy, the steps comprising:

providing a substrate with at least the top surface thereof being of electrically conductive material;

depositing by chemical vapor deposition on the top surface of said substrate an epitaxial layer of polycrystalline semiconductor material about 5–10 microns thick to form a semiconductor base layer;

recrystallizing said polycrystalline semiconductor material of said base layer so as to increase the average crystalline grain size thereof, as measured in a direction perpendicular to the thickness of said base layer, to at least equal to the thickness of said base layer;



epitaxially depositing a layer of GaAs containing semiconductor material on said base layer to form a semiconductor active layer, the semiconductor materials of said base layer and said active layer having substantially matched lattice parameters and thermal expansion characteristics over a selected temperature range;

forming an outside protective layer, including at least a layer of a semitransparent metal on said semiconductor active layer, with light energy reaching said active layer through said protective layer; and

attaching in electrical contact a grid electrode to said metal layer.

4,321,100

METHOD OF JOINING BORON NITRIDE TO A REFRACTORY

Stanley DuBuske, Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1981, Ser. No. 247,567

Int. Cl.³ C03B *29/00*; C04B *33/34, 37/00*

U.S. Cl. 156—89 **9 Claims**

1. Method of joining boron nitride to a refractory at high temperatures, said method including the steps of

(A) coating a surface of the boron nitride with a mixture of paintable consistency of molybdenum disilicide and polyisobutyl methacrylate in an organic solvent,

(B) allowing the coated boron nitride surface to air dry, and

(C) placing the refractory in contact with the coated boron nitride surface and firing at a temperature about 1500° C. in an inert atmosphere.

4,321,101

METHOD AND APPARATUS FOR COATING SUBMERGED PORTIONS OF FLOATING STRUCTURES

Herman S. Preiser, 2 Revell Rd., Severna Park, Md. 21146; Arthur Ticker, 12117 Maddox La., Bowie, Md. 20715, and Kenneth J. Hatley, 38 Lawrence Rd., Madison, N.J. 07940

Filed Mar. 18, 1980, Ser. No. 131,312

Int. Cl.³ B29H *19/00*; B32B *35/00*; B44C *31/00*; B63B *43/16*

U.S. Cl. 156—239 **3 Claims**

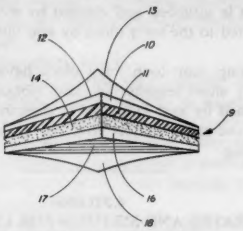
1. In a dry dock where a ship hull is supported on docking blocks after water is removed from the dry dock region, a method of coating the surface areas of the ship hull that are rendered inaccessible by the docking blocks when the ship hull is directly supported thereon, comprises the steps of:

underwater cleaning of the hull surfaces;

positioning multilayered hull tapes on the docking blocks, the hull tapes including a bottom layer with an adhesive surface, a top layer with an adhesive surface, and an intermediate layer containing a water soluble release agent for permitting separation of the bottom and top layers;

securing the adhesive surface of the bottom layer of the hull tapes to the docking blocks;

flooding the dry dock with water and positioning the hull of the ship above the docking blocks;



removing water from the dry dock region so that the ship settles onto the docking blocks and the adhesive surface of the top layers are secured to the hull surface;

admitting water to the dry dock region so that the ship hull is lifted off the docking blocks and the top and bottom layers of the hull tape are separated from each other along the intermediate layer containing the release agent.

4,321,102

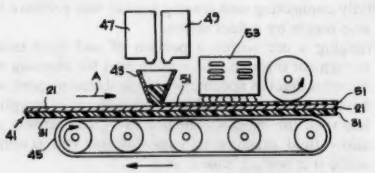
METHOD FOR MAKING GELATIN EPOXY SHEET MATERIALS

Jerome Drexler, Los Altos Hills, and Carl R. Betz, Los Altos, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Division of Ser. No. 98,830, Nov. 30, 1979, Pat. No. 4,279,989, which is a continuation-in-part of Ser. No. 951,359, Oct. 16, 1978, abandoned. This application May 4, 1981, Ser. No. 259,901

Int. Cl.³ G03C *1/78*

U.S. Cl. 156—246 **6 Claims**



1. A method for making a reinforced epoxy sheet material comprising,

applying a non-bonding layer of gelatin to a support,

applying a bonding fluid layer of epoxy plastic to said gelatin layer,

curing said epoxy layer to form a dimensionally stable sheet with said gelatin layer, and

separating said gelatin layer from said support, thereby producing a cured gelatin-epoxy sheet material.

4,321,103
MECHANISM FOR APPLYING MERCHANDISING LABELS TO PACKAGES/OBJECTS OF DIFFERENT WEIGHTS AND DIMENSIONS

John W. Lindstrom, Newfield; Walter A. Boyd, and Victor Del Rosso, both of Ithaca, all of N.Y., assignors to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Sep. 25, 1980, Ser. No. 190,817
Int. Cl.³ B44B 9/00; B32B 1/08
U.S. Cl. 156—351 15 Claims

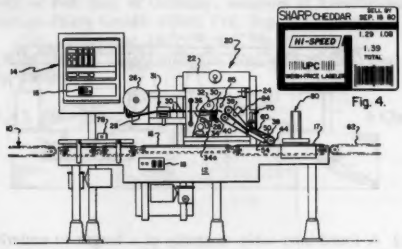


Fig. 4.

1. In a high speed articulated product delivery and individual article net weight, price per unit, and total price label applying system; wherein the products are separately weighed and assigned in sequence by means of a computer-memory and driver unit as they are being carried along by conveying means in synchronism with a label printing device so as to arrive at a pressure-sensitive label applying station in synchronism with their appropriate customer information and take-away price bearing labels; the improvement comprising:

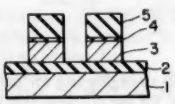
a label transport device including paired same-speed operating and oppositely running endless conveyor belts, each of which are carried by rollers at their opposite ends and have their co-directionally running flights arranged in pressed-together relation;

said transport means being disposed at one end thereof to receive between said belts said labels in sequence and to transport them in positionally-maintained relation between said belts to exit therefrom at the other end of said transport device and to be thereat rolled and applied by one of said rollers into adhesively fixed relation upon their pre-assigned particles as they are being carried along by said conveying means.

4,321,104
PHOTOETCHING METHOD

Norio Hasegawa, Hinodemachi; Naoki Yamamoto, Kawaguchi, and Hiroshi Yanazawa, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,852
Claims priority, application Japan, Jun. 18, 1979, 54-75714
Int. Cl.³ H01L 21/306; C23F 1/02
U.S. Cl. 156—643 6 Claims



1. A photoetching method comprising:

(a) stacking and depositing, in succession, an Al-Si alloy film having a thickness of approximately 400 nm to 1.5 μm, a silicon film having a thickness of approximately 10 to 100 nm and a photoresist film on a surface of a substrate or film on which a pattern is to be formed;

(b) exposing desired parts of said photoresist film to light and thereafter developing said photoresist film to form a photoresist pattern;

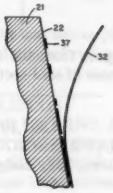
(c) etching and removing exposed parts of said silicon film and the underlying Al-Si alloy film by employing said photoresist pattern as a mask; and

(d) removing said photoresist pattern to provide an interconnection pattern of said Al-Si alloy film.

4,321,105
METHOD OF PRODUCING EMBOSSED DESIGNS ON SURFACES

Christ H. Melonio, Youngstown, and Gilbert P. Layfield, Warren, both of Ohio, assignors to Standex International Corporation, Salem, N.H.

Continuation of Ser. No. 921,765, Jul. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 832,092, Sep. 12, 1977, abandoned. This application Jan. 25, 1980, Ser. No. 115,402
Int. Cl.³ C23F 1/02
U.S. Cl. 156—660 14 Claims



1. A method for engraving designs on complex curved work surfaces such as on molds or dies, said work surfaces being employed for producing embossed designs on the corresponding complex curved surfaces of products formed from deformable materials, said method comprising the steps of:

preparing a master transparency from art work comprising the desired design;

exposing transfer material to said design on said master transparency, said transfer material comprising an emulsion, the exposed portion of which is acid resistant upon exposure, said emulsion being on a backing sheet;

removing unexposed areas of said emulsion to define discrete acid resistant image elements on said backing sheet;

transferring said image elements from said backing sheet to said work surfaces;

etching said work surfaces; and

removing said image elements from said work surfaces.

4,321,106
METHOD OF AND APPARATUS FOR THE THERMAL TREATMENT OF FLOWABLE MATERIAL

Lorenz Burkhard, Zurich, and Hans Fäs, Schlieren, both of Switzerland, assignors to Luwa AG, Zurich, Switzerland

Filed Jun. 30, 1980, Ser. No. 164,190
Claims priority, application Switzerland, Jul. 10, 1979, 6405/79
Int. Cl.³ B01D 1/22
U.S. Cl. 159—49 15 Claims

1. A method of thermally treating flowable material, comprising the steps of:

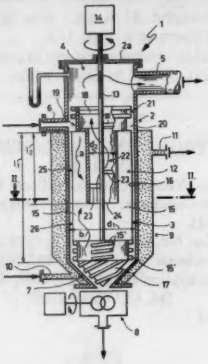
infeeding the material in a treatment chamber having a treatment wall;

spreading said material along a treatment zone in a thin layer on said treatment wall by mechanical spreading means;

passing all the resulting vapors only co-currently with the material in a first, upstream section of said treatment zone;

passing all the resulting vapors only counter-currently with the material in an adjoining second, downstream section of the treatment zone, said sections of the treatment zone abutting upon one another in a plane extending trans-

versely, preferably substantially perpendicular, to the direction of flow of the material; and



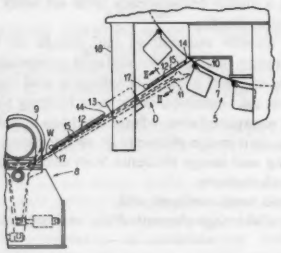
removing the vapors from the treatment zone only in said plane of abutment of said sections of the treatment zone.

4,321,107

METHOD OF SUPPRESSING PAPER WEB FLUTTER

Robert E. Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 939,462, Sep. 5, 1978, Pat. No. 4,179,330. This application Sep. 18, 1979, Ser. No. 76,611
The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.
Int. Cl.³ D21F *11/00*
U.S. Cl. 162—198 **7 Claims**



1. A method of handling a high speed continuously running paper web, comprising:

running the web in a generally horizontal free draw span between substantially spaced web handling means;

in said draw span running the web along and in adjacently spaced facing relation to foil means comprising a plate elongated in the direction of web travel and extending throughout a major portion of the span between said handling means and having a face in a plane extending across and longitudinally along and in adjacently spaced substantially parallel relation to one face of the web;

leaving the remaining face of the web facing an open space in said draw span;

and simply by the unaided running of the web in said relation to said plate face reducing and stabilizing the boundary layer of air between said high speed running web and said plate face and thereby suppressing tendency of the web to flutter.

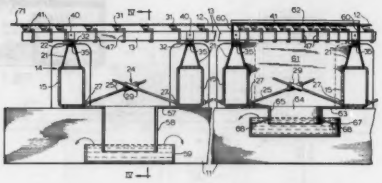
4. A method according to claim 1, which comprises scanning the basis weight and determining the moisture content of the web at an intermediate point in said draw span between an upstream flutter suppressing foil means plate and a downstream flutter suppressing foil means plate.

4,321,108

FOURDRINIER TABLE

Denis A. Goddard, Beloit, Wis., and Louis E. Dennis, Jr., Hillsboro, Oreg., assignors to Beloit Corporation, Beloit, Wis.

Filed Sep. 8, 1980, Ser. No. 184,987
Int. Cl.³ D21F *1/52, 1/54*
U.S. Cl. 162—272 **35 Claims**



12. A fourdrinier table assembly of a length to underlie a substantial portion of the forming length of a traveling fourdrinier wire in a paper making machine, and comprising:

a plurality of spaced beams arranged to extend transversely in cross machine direction under said forming length portion;

a plurality of spaced supporting rails carried on top of and spanning across and between said beams and adapted to extend in the machine direction under said forming length portion;

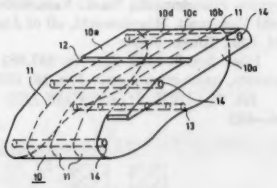
and a series of spaced elongate dewatering foils supported upon and extending in cross machine direction across said rails and adapted to act in dewatering relation with respect to the underside of the fourdrinier wire traveling along said forming length portion.

4,321,109

APPARATUS FOR CHANGING FABRICS IN PAPER MANUFACTURING MACHINES

Eino J. Haltsonen, and Martti T. Oksanen, both of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Division of Ser. No. 66,836, Aug. 15, 1979, Pat. No. 4,267,018. This application Aug. 15, 1980, Ser. No. 178,517
Claims priority, application Finland, Aug. 17, 1978, 782521
Int. Cl.³ D21F *7/00*
U.S. Cl. 162—274 **4 Claims**



1. An inflatable changing bag for use with a paper making machine, namely, for use in connection with changing a fabric loop thereof having a run with a certain configuration, comprising an inflatable bag which, upon being inflated, has a vertical cross-sectional configuration in the machine direction which is substantially the same as said certain configuration of the run of said fabric loop to be changed, said inflatable bag having a plurality of substantially vertical partitions provided in its interior extending in the machine direction, said partitions defining a plurality of airtight compartments within said bag, each compartment being provided with valve means for deflat-

ing each compartment independently of the other compartments.

4,321,110

SYSTEM FOR LOCATING LEAKS IN THE LINER OF A PRESSURE VESSEL EQUIPPED WITH COOLING TUBES

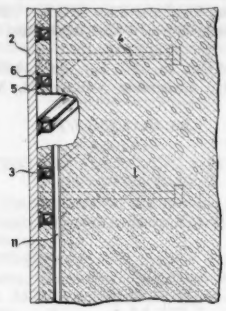
Manfred Nickel, Aachen, and Karl H. Escherich, Eschweiler, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,223

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856013

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—250 6 Claims



1. A system for locating leaks in the liner of a pressure vessel, such as a nuclear reactor pressure vessel, equipped with cooling tubes adjacent to the outer surface of the liner and with a concrete casing surrounding and in contact with the liner and the cooling tubes, said system comprising:

a set of passages along said cooling tubes and adjacent to said liner, constituted by passages (6) running lengthwise of said tubes and each having a plurality of lateral openings (7) into said concrete casing;

a multiplicity of connecting tubes (8) each connected to one of said passages (6) for leading leaking gas, if any, to the portion of the leak detection system which is located outside the concrete casing, and

means located outside said concrete casing for determining whether gas is leaking through said liner into the system and also for determining through which of said connecting tubes said leaking gas is passed.

4,321,111

INDUSTRIAL TECHNIQUE

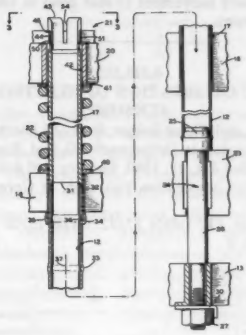
Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 845,767, Oct. 26, 1977, Pat. No. 4,208,248. This application Dec. 28, 1979, Ser. No. 107,958

Int. Cl.³ G21C *3/30*

U.S. Cl. 376—353 1 Claim

1. A control rod guide tube assembly comprising a hollow control rod guide tube having at least one open end, a hollow cylindrical sleeve telescoped over a portion of said guide tube, said sleeve having a flange formed on the inner surface thereof to engage said control rod guide tube, an annular groove formed in the outer surface of said sleeve, said sleeve having an end portion having at least one longitudinally arrayed slot that extends through said annular groove, a collar circumscribing a portion of said telescoped guide tube and sleeve, said collar



and circumscribed guide tube and sleeve portions being joined together to form an integral control rod guide tube assembly.

4,321,112

DEVICE FOR OPENING, CLOSING AND CLEANING FILL HOLES OF COKE OVEN CHARGEABLE BY A COAL CONVEYOR

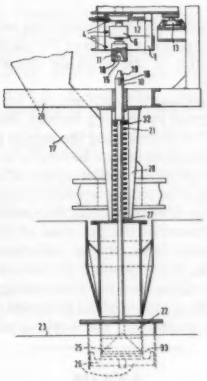
Manfred Galow, Essen; Klaus Dahl, Gelsenkirchen; Wolfgang Rohde, Essen; Diethard Habermehl, Essen; Werner Kucharzyk, Essen, and Werner Siebert, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,404

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016418

Int. Cl.³ C10B *25/20, 31/02, 43/04*

U.S. Cl. 202—241 12 Claims



1. In combination, a device for opening, closing and cleaning fill holes and a coke oven structure of the type having the fill holes arranged in its top cover and being chargeable by a coal conveyor, each fill hole being provided with a bell seal, a spring for urging the bell seal into its closing position, an actuation member connected to said bell seal, and a pair of juxtaposed cleaning knives arranged on said actuation member in the range of the bell seal for rotation in said fill hole, the device comprising a self-supporting carrying frame extending above said top cover of the oven, a manipulation unit supported on said carrying frame for movement above said actuation members of respective bell seals, said manipulation unit

including a thrust-and-turn head engageable with an actuation member, a vertical linear drive for imparting a reciprocating vertical movement to said head, and a rotary drive means for imparting a rotary movement to said head in addition to said vertical movement.

4,321,113

ELECTRONIC CALIBRATION OF ELECTROCHEMICAL SENSORS

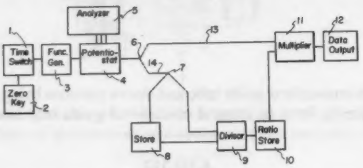
Lutz Grambow, and Dieter Krüger, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,663

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929387

Int. Cl.³ G01N *27/52*; G12B *13/00*

U.S. Cl. 204—1 T **5 Claims**



1. In an electrochemical sensor arrangement for sensing the partial pressure of gases of the type having a working electrode with an electrode potential which varies relative to time, an improved means for calibrating the arrangement comprising

a calibrator electrode having an electrode potential equal to that of the working electrode,

a function generator operable to decompose an oxide coating on the working electrode to generate a limiting oxygen reduction current,

timer means for periodically starting the operation of the function generator,

means for measuring the limiting oxygen reduction current,

means for measuring the potential of the calibration electrode,

means for measuring the potential of the working electrode,

means for dividing the potential of the calibration electrode by the potential of the working electrode to obtain a quotient, and

means for multiplying the quotient and the limiting oxygen reduction current to obtain a current data output.

5. In a method for determining the partial pressure of gases using an electrochemical sensor having a working electrode with an electrode potential which varies relative to time, the improved method of correcting a potential signal generated by the electrode comprising measuring the potential of a calibration electrode, measuring the potential of the working electrode, measuring the limit oxygen reduction current of the working electrode, and adjusting the measured limit oxygen reduction current of the working electrode by multiplying the value thereof by the quotient of the potential of the calibration electrode and the potential of the working electrode.

4,321,114

ELECTROCHEMICAL DOPING OF CONJUGATED POLYMERS

Alan G. MacDiarmid, Drexel Hill; Alan J. Heeger, Wynnewood, and Paul J. Nigrey, Philadelphia, all of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed Mar. 11, 1980, Ser. No. 129,439

Int. Cl.³ H01M *10/44*

U.S. Cl. 204—2.1 **28 Claims**

1. A reversible electrochemical method for modifying the electrical conductivity properties of an organic polymer which is dopable with an anionic dopant species to a more highly electrically conducting state, comprising the steps of:

(a) providing an electrochemical cell comprising an anode means, a cathode means, and an electrolyte, said anode means including said polymer as an anode-active material, said electrolyte comprising a compound which is ionizable into said anionic dopant species; and

(b) operating said electrochemical cell so as to effect an increase in the oxidation state of said polymer, whereby said polymer becomes doped with said anionic dopant species to a more highly electrically conducting state;

said organic polymer being a conjugated polymer characterized by having conjugated unsaturation along a main backbone chain thereof, whereby the range of selectivity of room temperature electrical conductivity of the resulting doped polymer extends into the metallic regime.

4,321,115

METHOD AND DEVICE FOR PROVIDING A CONTINUOUS MEASURED SUPPLY OF ALUMINA TO AN ELECTROLYTIC CELL

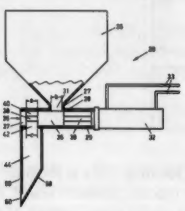
Hans J. Rebmann, Sion, and Theo Mueller, Moehlin, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 25, 1980, Ser. No. 124,598

Claims priority, application Switzerland, Mar. 2, 1979, 2064/79

Int. Cl.³ C25C *3/14*

U.S. Cl. 204—67 **15 Claims**



12. A method for feeding measured amounts of alumina to the break in the crust in an elecrolytic cell which comprises: providing an alumina silo containing alumina to be fed to the cell; feeding alumina from said silo to a feed pipe communicating with said silo by means of an inlet opening in said pipe; providing an outlet opening on said feed pipe communicating with said cell; and transferring measured amounts of alumina from said inlet opening by means of a movable piston arrangement to said outlet opening for feeding to said cell, providing a feeding space defined by said piston arrangement, wherein a measured amount of alumina is fed to said feeding space in a first operative position of said piston arrangement and wherein said measured amount of alumina is fed from said feeding space to the cell via said outlet opening in a second operative position of said piston arrangement, with said measured amount of alumina being fed to a space defined by two pistons, and transferred from said space by movement of said pistons.

4,321,116

ISOTOPE SEPARATION PROCESS

Edward T. Maas, Jr., Kendall Park, and Donald M. Cox, Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

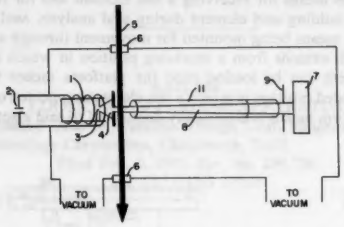
Filed Feb. 22, 1979, Ser. No. 14,107

Int. Cl.³ B01D *59/00, 59/34*

U.S. Cl. 204—158 R **15 Claims**

1. A process for the separation of isotopes of an element, said process comprising vaporizing a uranyl compound having the formula $(UO_2AA')_n$ wherein A and A′ are monovalent anions and n is an integer greater than 1, said compound having an isotopically shifted infrared absorption spectrum associated with the uranyl ions containing said element, and irradiating

said uranyl compound with infrared radiation which is preferentially absorbed by a molecular vibration of uranyl ions of said uranyl compound containing a predetermined isotope of



said element so as to provide excited molecules of said compound enriched in said molecules of said compound containing said predetermined isotope, enabling separation of said excited molecules.

4,321,117

PROCESS FOR PREPARING A POLYMER COMPOSITION

Isao Kaetsu; Masaru Yoshida, and Minoru Kumakura, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 8, 1979, Ser. No. 18,617

Claims priority, application Japan, Mar. 9, 1978, 53-27109; Apr. 28, 1978, 53-51239; Aug. 29, 1978, 53-105306; Aug. 30, 1978, 53-106097

Int. Cl.³ C08G 2/46; A61K 9/22

U.S. Cl. 204—159.16 **12 Claims**

1. A process for preparing a polymer composition containing a physiologically active substance characterized by contacting one or more polymerizable monomers and said physiologically active substance in the presence of a crystallizable substance, forming into a specific shape, and irradiating said shape with light or an ionizing radiation at a low temperature below room temperature to polymerize said polymerizable monomers, said crystallizable substance being crystallized at the irradiation temperature.

4,321,118

BIS BENZOYL SENSITIZERS FOR PHOTOPOLYMERIZATION OR PHOTO CROSS LINKING PROCESS AND COMPOSITION

Louis Felder, Basel; Rudolf Kirchmayr, Aesch, and Rinaldo Hüsler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

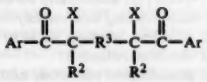
Continuation-in-part of Ser. No. 970,016, Dec. 18, 1978. This application Dec. 19, 1979, Ser. No. 105,744

Claims priority, application Switzerland, Dec. 22, 1977, 15884/77; Mar. 8, 1978, 2518/78; Sep. 18, 1978, 9723/78

Int. Cl.³ C08F 2/50; C08J 3/28

U.S. Cl. 204—159.18 **14 Claims**

1. In a method for the photopolymerization of unsaturated compounds or for the photochemical crosslinking of polyolefins employing a sensitizer, the improvement according to which the sensitizer is a compound of the formula



or

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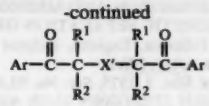
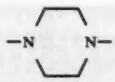


wherein

Ar is a member selected from the group consisting of phenyl, naphthyl, phenanthryl, anthracyl, diphenylyl, chlorophenyl, bromophenyl, dichlorophenyl, mesityl, isopropylphenyl, phenoxyphenyl, cyanophenyl, p-nonylphenyl, hydroxyphenyl, tolyl, tert-butylphenyl, xylyl, isopropylchlorophenyl, methoxyphenyl, ethoxyphenyl, phenoxyphenyl, chlorotolyl, bromoxylyl, methylthiophenyl, phenylthiophenyl, butylsulfophenyl, phenylsulfophenyl, ethoxycarbonylphenyl, tert-butoxycarbonylphenyl, methylaminosulfophenyl, dipropylaminosulfophenyl, dimethylaminophenyl, benzoylaminophenyl and acetylaminophenyl,

X represents —OR⁶,

X′ represents



R^1 represents (a) C_1–C_8 alkyl, (b) C_1–C_8 alkyl substituted by —OH, Oalk, C_2–C_8 acyloxy, —NR^4R^5, —COOalk or —CN, (c) C_3–C_4 alkenyl, (d) C_5–C_6 cycloalkyl or (e) C_7–C_9 phenylalkyl,

R^2 has one of the meanings assigned to R^1 or represents a —$CH_2CH_2R^{13}$ group, or together with R^1 represents C_2–C_8 alkylene or C_3–C_9 oxaalkylene or C_3–C_9 azaalkylene,

R^3 represents a direct bond, C_1–C_6 alkylene, C_2–C_6 oxaalkylene, C_2–C_6 thiaalkylene, S-oxathiaalkylene or S-dioxathiaalkylene, phenylene, diphenylene or a -phenylene-T-phenylene group, or together with both substituents R^2 and both carbon atoms to which these substituents are attached, forms a cyclopentane, cyclohexene, endomethylenecyclohexane or cyclohexane ring,

T represents —O—, —S—, —SO_2—, —CH_2—, —CH_2—CH_2—, —CH_2OCH_2— or —CH=CH—,

R^4 represents (a) C_1–C_{12} alkyl, (b) C_2–C_4 alkyl substituted by —OH, Oalk or —CN, (c) C_3–C_5 alkenyl, (d) cyclohexyl, (e) C_7–C_9 phenylalkyl, (f) phenyl or (g) phenyl which is substituted by Cl, alk, OH, Oalk or —COOalk,

R^5 represents (a) C_1–C_{12} alkyl, (b) C_2–C_4 alkyl which is substituted by —OH, Oalk or —CN, (c) C_3–C_5 alkenyl, (d) cyclohexyl or (e) C_7–C_9 phenylalkyl, or R^4 and R^5 together represent C_4–C_5 alkylene which can be interrupted by —O— or

R^6 represents (a) hydrogen, (b) C_1–C_{12} alkyl, (c) C_1–C_8 alkyl which is substituted by Cl, Br, OH, Oalk, Salk, C_2–C_8 acyloxy, —COOalk, CONHalk, —CON(alk)$_2$ or CN, (d) C_3–C_5 alkenyl, (e) cyclohexyl, (f) benzyl, (g) phenyl, (h) phenyl substituted by Cl or alk, or (i) 2-tetrahydropyranyl,

R^{13} represents —$CONH_2$, —CONHalk, —CON(alk)$_2$, —P(O)(Oalk)$_2$, 2-pyridyl or 2-oxo-1-pyrrolidinyl, and

R^{14} represents C_1–C_4 alkyl, —CH_2CH_2CN or —CH_2CH_2COOalk.

4,321,119

BUFFER COMPOSITION AND METHOD FOR THE ELECTROPHORETIC SEPARATION OF PROTEINS

Jeffrey Ambler, Tollerton, England, assignor to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Nov. 7, 1979, Ser. No. 92,249
Int. Cl.³ B01D 57/02; G01N 33/68; A61K 31/60
U.S. Cl. 204—180 R 7 Claims

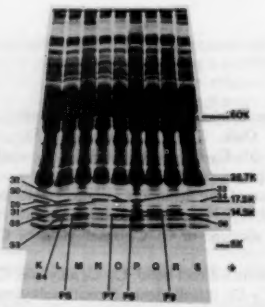
1. A composition for the preparation of a buffer solution for use in the electrophoretic separation of proteins, said composition consisting essentially of a water soluble salicylate, a water soluble alkali metal salt to increase the ionic concentration of the solution, and buffer sufficient to maintain the pH of the solution at from 8.2 to 9.0 during the electrophoresis.

4,321,120

PROCESS FOR DETECTING PROTEINS SPECIFIC TO HYPERTENSION IN MAMMALS

Ronald V. Nardi, 6 Meadowbrook Pl., Willingboro, N.J. 08046, and Prabhavathi B. Fernandes, 501 Broadacres Rd., Penn Valley, Pa. 19072

Filed Mar. 19, 1980, Ser. No. 131,615
Int. Cl.³ G01N 27/26
U.S. Cl. 204—180 G 18 Claims



1. A process for diagnosing the presence of essential hypertension or a predisposition to essential hypertension in a human comprising detecting the presence in a body fluid of the human of at least one protein associated with hypertension.

4,321,121

ELECTROPHORETIC TECHNIQUE FOR SEPARATING LACTATE DEHYDROGENASE ISOENZYMES AND IMPROVED ELECTROPHORETIC GEL FOR USE THEREIN

William A. Gurske, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 19, 1981, Ser. No. 226,571
Int. Cl.³ G01N 27/26
U.S. Cl. 204—180 G 91 Claims

1. An electrophoretic gel of the type comprising a polysaccharide, characterized in that said electrophoretic gel further comprises a galactomannan polysaccharide.

4,321,122

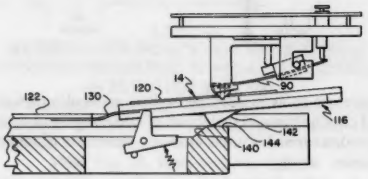
APPARATUS FOR FORMING ELECTRICAL CONTACT WITH AN ANALYSIS SLIDE

Rodney J. Whitcomb, Rochester, and Henry S. Adamski, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,568
Int. Cl.³ G01N 27/28, 27/46
U.S. Cl. 204—195 R 20 Claims

1. Apparatus for effecting an electrical connection between an electrometer and a generally planar test element in the chemical analysis of a sample fluid, said element comprising a pair of electrodes, each of said electrodes having a plurality of layers including a layer of conductive material formed on a flexible nonconductive support, said apparatus comprising:

platform means for receiving a test element and for releasably holding said element during said analysis, said platform means being mounted for movement through a path which extends from a receiving position in which a test element can be loaded onto the platform means to an extended position in which a test element supported on the platform means is electrically connected to said electrometer;



a plurality of probe tips electrically connected to said electrometer;

means for supporting said tips in the path of said platform means; and

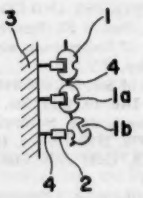
actuating means operable on said platform means for moving an element supported on said platform into contact with said tips with a force sufficient to cause said tips to penetrate into said electrodes and for effecting relative movement between said tips and said element in a direction generally parallel to said layers after said penetration, said relative movement causing said tips to plow through said layers to form a ridge of conductive material around said tips.

4,321,123

COENZYME IMMOBILIZED ELECTRODE

Kenichi Nakamura, Hirakata; Shiro Nankai, Neyagawa, and Takashi Iijima, Kirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 32,929, Apr. 19, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,271
Claims priority, application Japan, Apr. 21, 1978, 53/47984; Apr. 21, 1978, 53/47985
Int. Cl.³ C12Q 11/00
U.S. Cl. 204—195 B 5 Claims



1. A process for preparing a coenzyme immobilized electrode, which comprises (1) providing a coenzyme of oxidoreductase, said coenzyme being selected from the group consisting of NAD and NADP, (2) chemically modifying an electron collector, and (3) immobilizing said coenzyme on said electron collector through covalent bonding, so as to perform electron transfer with said electron collector.

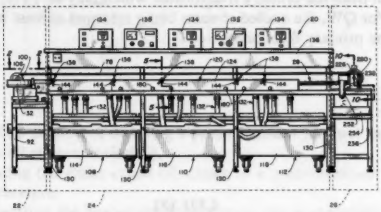
2. A coenzyme immobilized electrode comprising at least a coenzyme of oxidoreductase and an electron collector, said

coenzyme, which is selected from the group consisting of NAD and NADP, being immobilized through covalent bonding on said electron collector, said immobilized coenzyme being in electrical contact with said electron collector.

4,321,124
LOOSE PARTS PLATING APPARATUS

Alexander P. Audelo, Westlake Village, Calif., assignor to Select Technology Corporation, Chatsworth, Calif.

Filed Feb. 2, 1981, Ser. No. 230,756
Int. Cl.³ C25D *17/28*
U.S. Cl. 204—202 **24 Claims**



1. A loose parts plating apparatus comprising:

plating bath means for electrodepositing of a thin layer of metal onto a part to be plated;

movement means for locating in a series arrangement a plurality of said parts, said movement means to cause only a portion of said parts to be conducted through said plating bath;

an installing station for installing said parts on said movement means prior to being moved into said plating bath;

a discharge station for removing said parts from said movement means after moving of said parts out of said plating bath; and

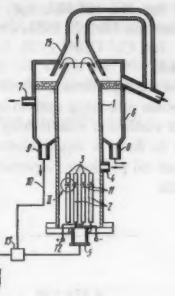
said plating bath means including a plating reservoir assembly and a separate storage reservoir for plating solution, conduit means connecting said plating reservoir assembly and said storage reservoir for the conducting of plating solution therebetween.

4,321,125
APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vyacheslav T. Efimov, ulitsa Sumskaya, 59, kv. 2; Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91a, kv. 30; Nikolai N. Zmievskoi, ulitsa Tonkopia, 11/1, kv. 84, and Pavel P. Shaty, ulitsa Roberta Eidemana, 12, kv. 52, all of Kharkov, U.S.S.R.

Filed Jul. 9, 1980, Ser. No. 167,131
Int. Cl.³ C02C *5/12*
U.S. Cl. 204—273 **3 Claims**

1. In an apparatus for continuous electrochemical purification of contaminated liquids comprising, an electrocoagulation chamber for containing an electrolyte and having upstanding soluble elongated electrodes therein, means to introduce said electrolyte into said electrocoagulation chamber and flow it between the electrodes, means to introduce contaminated liquid into said electrocoagulation chamber while it contains said electrolyte, said electrodes being disposed laterally spaced from each other and extending in parallel relationship, a plurality of solid, elongated insulative partitions disposed next adjacent to the electrodes defining jointly with the electrodes a plurality of separate liquid flow paths between the next adja-

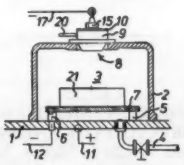


cent electrodes to preclude mixing and turbulence of the electrolyte as it flows through said flow paths.

4,321,126
PROCESS FOR FORMING A METAL OR ALLOY LAYER ON AN ELECTRICITY-CONDUCTING WORK PIECE AND DEVICE FOR EXECUTING SAME

Wolfgang Kieferle, Lindenstrasse 23, D 7981 Grünkraut, Fed. Rep. of Germany, and Franz Wäschle, Weingarten, Fed. Rep. of Germany, assignors to Wolfgang Kieferle, Fed. Rep. of Germany

Division of Ser. No. 56,121, Jul. 9, 1979, Pat. No. 4,288,306.
This application Mar. 3, 1980, Ser. No. 126,629
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830134
Int. Cl.³ B05B *7/00*
U.S. Cl. 204—298 **10 Claims**



1. A device for use in coating a metal or alloy layer onto an electricity-conducting work piece comprising:

a low pressure chamber; vacuum producing means extending into said chamber for reducing the pressure thereof; a work piece support platform mounted within said chamber; an ion producer unit connected to said chamber; said unit being adapted to receive and ionize a carrier gas and spender medium; an electrode of first polarity connected to said chamber and unit; and electrode of opposite polarity connected to said platform; arc discharge means extending into said chamber; and means for placing said carrier gas into turbulence interposed between said unit and said chamber.

4,321,127

COAL LIQUEFACTION USING LIQUID CLATHRATES

Jerry L. Atwood, Tuscaloosa, Ala., assignor to University of Alabama, University, Ala.

Continuation of Ser. No. 138,997, Apr. 10, 1980, abandoned. This application Mar. 5, 1981, Ser. No. 240,903

Int. Cl.³ C10G 1/00, 21/12

U.S. Cl. 208—8 LE 26 Claims

1. A method for the liquefaction of solid carbonaceous material which comprises admixing said solid carbonaceous material with a liquid clathrate, maintaining said admixture for a period sufficient to form a liquid clathrate layer containing liquified petroleum oil products, separating said petroleum oil from said clathrate.

4,321,128

PHOSPHORUS PASSIVATION PROCESS

Jin S. Yoo, Flossmoor, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 19, 1980, Ser. No. 150,852

Int. Cl.³ C10G 11/18, 47/12

U.S. Cl. 208—114 10 Claims

1. In a process for converting a hydrocarbon material having at least one metal contaminant selected from the group consisting of nickel, vanadium, iron and copper which comprises contacting the hydrocarbon material in a reaction zone at hydrocarbon conversion conditions with a catalyst to form a conversion product and a deactivated catalyst having carbonaceous deposits and containing at least a portion of said metal contaminant, and regenerating at least a portion of said deactivated catalyst to restore at least a portion of the catalyst activity by removing at least a portion of said carbonaceous deposits to form a regenerated catalyst, the improvement which comprises: contacting at least a portion of said regenerated catalyst with a liquid medium containing an effective amount of at least one phosphorus compound for passivating a metal contaminant substantially free from any material selected from the group consisting of antimony and bismuth containing species for a time sufficient to permit at least a portion of said phosphorus compound to interact with said portion of said regenerated catalyst to form a treated catalyst containing phosphorus atoms from said phosphorus compound, contacting at least a portion of said treated catalyst with an oxidative wash to form a washed catalyst, and transferring at least a portion of said washed catalyst to said reaction zone.

4,321,129

CRACKING PROCESS EMPLOYING CATALYST HAVING COMBINATION OF ANTIMONY AND TIN

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 941,896, Sep. 12, 1978, Pat. No. 4,255,287, which is a continuation-in-part of Ser. No. 845,184, Oct. 25, 1977, abandoned. This application Mar. 17, 1980, Ser. No. 130,678

Int. Cl.³ C10G 11/05, 11/18

U.S. Cl. 208—120 76 Claims

1. A process for cracking a hydrocarbon feedstock which comprises contacting said hydrocarbon feedstock with a zeolite-containing cracking catalyst under cracking conditions wherein said cracking catalyst has been modified with a modifying amount of a treating agent which comprises (A) at least one of elemental antimony and compounds of antimony and (B) at least one of elemental tin and compounds of tin.

4,321,130

THERMAL CONVERSION OF HYDROCARBONS WITH LOW ENERGY AIR PREHEATER

George J. Bacsik, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 5, 1979, Ser. No. 100,468

Int. Cl.³ C10G 9/16

U.S. Cl. 208—130 13 Claims

1. In a process in which a hydrocarbon feed is cracked in the presence of steam at temperatures in the range of about 1200° to 1800° F. in a pyrolysis reactor located within a furnace burning a mixture of fuel and air and the pyrolysis products are passed to an externally located, connected primary fractionator where they are separated into fractions by distillation, the improvement which comprises preheating the combustion air by heat exchange with liquid low level temperature streams taken from the primary fractionator which may be TPA, BPA and/or QW, the cooled streams being returned at least in part to the primary fractionator.

4,321,131

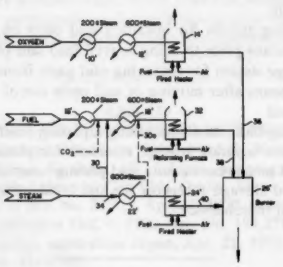
PROCESS FOR HEAT CARRIER GENERATION

Christopher M. Lowe, Saint Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 15, 1980, Ser. No. 254,506

Int. Cl.³ C07C 2/10, 4/02, 4/04; C10G 9/36

U.S. Cl. 208—130 12 Claims

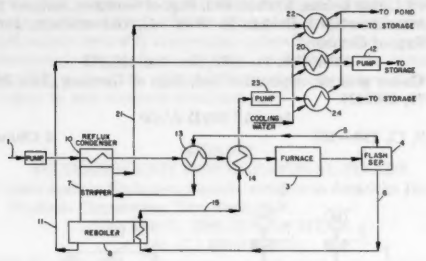


1. In an advanced cracking reaction process, wherein a stream of hot gaseous combustion products is developed in a first stage combustion zone by the burning of a fluid fuel in an oxidant and in the presence of steam, and hydrocarbon feedstock to be cracked is injected and mixed, in a second stage reaction zone, into the hot gaseous combustion products stream to effect the cracking reaction, and wherein each of the oxidant, fuel and steam process streams are preheated prior to admixture and combustion, the improvement which comprises: separately preheating said oxygen stream; joining said fuel stream and at least a portion of said steam process stream to form a stream having a steam-to-fuel ratio between 0.1–10 and preheating the joined stream; reforming said joined stream at a temperature up to about 1000° C. in the presence of a reforming catalyst comprising at least one metal selected from the metals of Group VIII of the Periodic Table of Elements on an inert support capable of imparting structural strength; separately preheating any remainder of the process steam; and mixing said preheated oxidant, joint and remainder steam process streams to burn in admixture in said first stage combustion zone to provide said hot gaseous combustion products stream.

4,321,132
DISTILLATION OF CRUDE OIL

George W. Richards, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 12, 1980, Ser. No. 149,109
Int. Cl.[3] B01D *3/06*; C10G *7/00*
U.S. Cl. 208—352 4 Claims



1. The method of distilling a predetermined product from a crude oil stream, including,

heating the entire crude oil stream to a predetermined temperature,

separating the heated crude oil stream into a vaporized first portion and a liquified second portion,

indirectly cooling the first vaporized portion of the crude oil stream with the total crude oil stream prior to the heating of the stream in preparation of the stream for its separation, and

distilling the first separated portion of the cooled crude oil stream by

(1) indirect heat exchange with the second separated portion of the entire stream, and

(2) indirect heat exchange with the entire stream before the entire stream is heated in preparation for the separation of the entire stream into liquid and vapor portions,

to produce from the vapor portion a product of fractions of predetermined boiling range and flash point and vapor pressure.

4,321,133
SORTING OF LIMESTONE ORES USING FLUORESCENT COMPOUNDS

Peter M. DiGiacomo, Mission Viejo, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Dec. 31, 1979, Ser. No. 108,611
Int. Cl.[3] B07C *5/02*, *5/34*
U.S. Cl. 209—3.3 17 Claims

1. A process for separating limestone ore particles, which include relatively higher grade ore particles and relatively lower grade ore limestone ore particles, from gangue particles comprising the steps of:

a. conditioning the particles with a conditioning agent comprising a compound having both a surface-selective functional group and a fluorescent moiety, which renders the compound fluorescent when exposed to external radiation, to selectively coat either

i. at least a portion of the ore particles, or

ii. at least a portion of the gangue particles

leaving the other particles substantially uncoated;

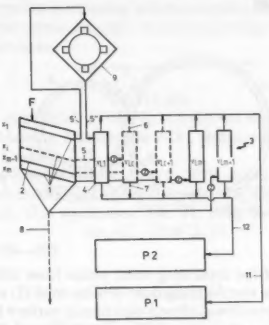
b. irradiating the conditioned particles to excite and induce fluorescence of the conditioning agent to a degree sufficient for distinguishing the coated particles from the substantially uncoated particles; and

c. separating the fluorescing, coated particles from the substantially uncoated particles.

4,321,134
METHOD OF AND SORTING ASSEMBLY FOR DRY SORTING GRANULAR MIXTURES OF TWO OR MORE POLYDISPERSED COMPONENTS

Kurt Leschonski, Am Dammgraben 20, and Stephan Röthele, Hüttenweg 9, both of D-3392 Clausthal-Zellefeld, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 78,948
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842295
Int. Cl.[3] B07B *9/00*
U.S. Cl. 209—30 15 Claims



1. A method of dry sorting a mixture of p granular polydisperse solid components to be sorted, where p is at least two, the particles of which component differ in density and/or shape and have at least partially overlapping grain size and settling rate distributions, comprising:

a. first classifying, by means of m successive sievings, where m is at least three, the mixture into m+1 successive screening classes in which the mesh size x_i of each sieving is selected so that the settling rate of the particles of each component to be sorted in each screening class differs from or only slightly overlaps the settling rates of the particles of other components in such class, the mesh size x_i determined by the smaller mesh size x_i+1 of the next sieve according to the equation:

$$x_i \leqq x_{i+1} \sqrt[n]{(\rho_S/\rho_L)_{min}}$$

in which n is a parameter between 2 and 1, allowing for the inclination of the curve of the drag coefficient of the sifting air flow around the particles at the sifting air velocity, and has a value of 2 in the range of laminar flow and a value of 1 in the range of turbulent flow, and a value which decreases from 2 to 1 approximately proportionally to the logarithm of the Reynolds number in the transitional range of flow, and $(\rho_S/\rho_L)_{min}$ is the smallest ratio of the density ρ_S of a heavier component and the density ρ_L of a lighter component;

b. then separately sorting at least the integral value of ((m/2)+2) of the m+1 screening classes by means of p−1 wind siftings, each screening class to be sorted being sorted into p settling rate fractions of one component each, said wind siftings being carried out at individual sifting air velocities selected for each screening class such that the particles of the respective components to be sorted having the highest and lowest settling rates are substantially separated; and

c. recovering the light fraction after each sifting and the light and heavy fractions of the last sifting.

4,321,135

METHOD FOR SEPARATING SOLID PHASE FROM DRILLING MUD

Ulmas D. Mamadzhanov, TS-1, dom 19, kv. 25; Vitold M. Bakhir, proezd Gaidara, 7-a, kv. 17; Stanislav A. Alekhin, Chilanzar, kvartal 24, dom 53, kv. 89, and Vladimir I. Klimenko, Chilan-zar, kvartal 23, dom 3, kv. 37, all of Tashkent, U.S.S.R.

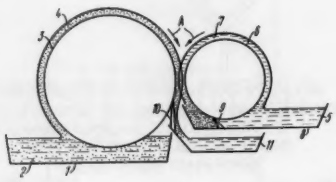
PCT No. PCT/SU80/00016, § 371 Date Nov. 27, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02044, PCT Pub. Date Oct. 2, 1980

PCT Filed Feb. 1, 1980, Ser. No. 224,549

Claims priority, application U.S.S.R., Mar. 27, 1979, 2736502

Int. Cl.³ B03B 5/00

U.S. Cl. 209—49 3 Claims



1. A method for separating solid phase from drilling mud, characterized in that forming from drilling mud (2) an adhesive layer (4) on a revolving closed curvilinear surface (3) by partially submerging it in the drilling mud (2) and forming an adhesive layer (7) of a treatment liquid (5) on another closed curvilinear surface (6) by partially submerging it in the treatment liquid and causing it to rotate in the direction opposite to the rotation direction of the first revolving curvilinear surface; both closed curvilinear surfaces (3,6) being arranged in such a manner that their respective adhesive layers (4,7) penetrate one another at a depth which is sufficient for the adhesive layer (4) of the treatment liquid (2) to take-off coarse particles of solid phase from the adhesive layers (7) of the drilling mud (5); the linear velocities of the adhesive layer (4,7) being chosen in such a manner that the resultant centrifugal forces be equal to or lower than the centripetal forces.

4,321,136

FUEL FILTERING DEVICE FOR ENGINE

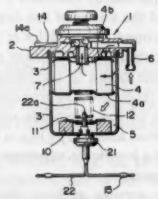
Katsuhiko Matsui, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 16, 1980, Ser. No. 160,058

Claims priority, application Japan, Jun. 21, 1979, 54-84145[U]

Int. Cl.³ B01D 27/10

U.S. Cl. 210—86 8 Claims



1. A fuel filtering device for a Diesel engine, including a fuel filter assembly having therein a filtering element through which fuel flows, the improvement comprising: a heating member contained within said filter assembly and being operable when supplied with electric current to heat fuel in the fuel filter assembly, the resistance of said heating member to the flow of electric current therethrough being directly proportional to the temperature thereof; an electric circuit operable when closed to supply electric current to said heating member; and, a temperature sensor associated with said filtering device for sensing the temperature of fuel therein and for closing said electric circuit when said temperature is lower than a predetermined temperature.

4,321,137

APPARATUS FOR PROCESSING LIQUIDS SUCH AS WATER AND THE LIKE BY REVERSE OSMOSIS

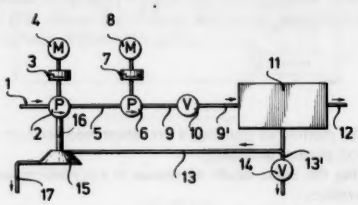
Wolf-Ulrich Kohler, Krefeld, Fed. Rep. of Germany, assignor to Maschinenfabrik Buckau R. Wolf AG, Grevenbroich, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,853

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907429

Int. Cl.³ B01D 31/00

U.S. Cl. 210—137 6 Claims



1. An improved apparatus for processing a solution, such as waste water and the like by means of a reverse osmosis unit, having an inlet for the solution and two outlets for pure water and concentrate wherein the solution is conducted to the reverse osmosis unit by a first pump driven by a motor, the pressurized concentrate being expanded in a turbine which is connected to said first pump while the pure water is withdrawn in a pressureless state, the improvement which comprises: a second pump associated to said first pump and located between said first pump and said reverse osmosis unit, the second pump being connected to an individual motor via a clutch, wherein the motor of said first pump is connected thereto via a disengageable clutch.

4,321,138

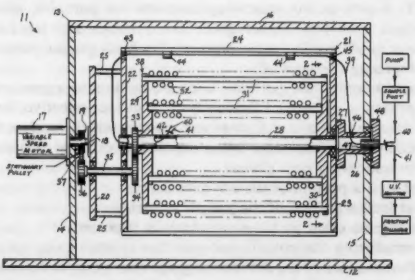
METHOD AND APPARATUS FOR PREPARATIVE COUNTERCURRENT CHROMATOGRAPHY EMPLOYING A ROTATING COLUMN ASSEMBLY

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,498

Int. Cl.³ B01D 15/08

U.S. Cl. 210—198.2 12 Claims



1. An apparatus for continuous countercurrent chromatography comprising a support, frame means journalled to said support, motor means drivingly connected to said frame

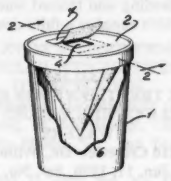
means, a chromatography column assembly rotatably mounted in said frame means for rotation around the same axis of rotation as that of the frame means, said column assembly having inlet and outlet flow tube means supportingly carried by the frame means and extending from the support substantially coaxially with said common axis of rotation, and means gearingly coupling said column assembly to said support so as to drive the column assembly at a rotational speed twice that of the frame means and in the same direction relative to said support, whereby to avoid twisting of said flow tube means, said column assembly comprising a plurality of interconnected chromatography column segmenta mounted on the column assembly so as to be substantially dynamically balanced with respect to said common rotational axis.

4,321,139

FILTERING UNIT FOR BIOLOGICAL FLUIDS

Claude Auclair, Soulanges, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed May 7, 1980, Ser. No. 147,032
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—232 **6 Claims**



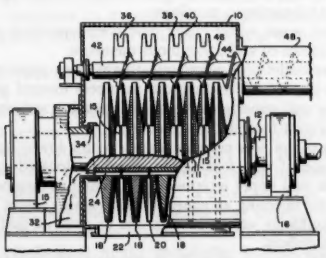
1. A filter unit adapted for reverse filtration of a liquid sample comprising a container with an open top defining a chamber for receiving a liquid sample to be filtered; cover means for closing the top of the container; a conical filter element, disposed within said chamber and extending below the cover means, forming an inner chamber defined by the inner surfaces of the filter element and the cover means; means independent of said container and associated with the cover means and cooperating with the upper rim of the filter element for maintaining the filter element in juxtaposition with the cover means; an aperture is said cover means disposed over said inner chamber for withdrawing a filtered liquid sample and sealing means associated with said aperture for covering said aperture.

4,321,140

DISK PRESS

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 1, 1980, Ser. No. 192,899
Int. Cl.³ B01D *33/26*
U.S. Cl. 210—327 **5 Claims**



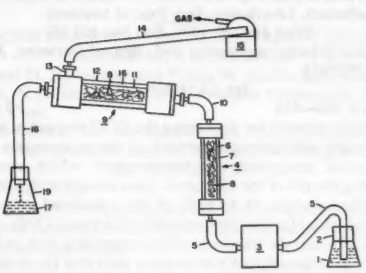
1. A disk press comprising: a pair of rotatable shafts, said shafts being spaced apart along the same plane; a plurality of longitudinally-spaced disks mounted on each rotatable shaft, the space between the shafts and the dimensions of the disks being such that disks on each shaft extend into the space between adjacent disks on the other shaft to provide pressing areas; means for rotating one shaft clockwise and the other shaft counterclockwise; means for feeding wet material into the in-running sides of the disks; means for forming cakes on the in-running sides of disks; said cakes being pressed to a higher consistency in the pressing areas; and longitudinally-spaced sets of doctors extending into the spaces between the disks for removing the pressed cake from the disks at the out-running side of the disks, said doctors being constructed to provide separate in-running and out-running sides of the disks, and prevent removed cake from re-entering the in-running sides of the disks.

4,321,141

METHOD FOR PROCESSING WASTE

Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 44,505, Jun. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 880,779, Feb. 24, 1978, abandoned. This application Apr. 11, 1980, Ser. No. 139,228
Int. Cl.³ C02F *3/30*
U.S. Cl. 210—603 **39 Claims**



1. A method for continuously processing biodegradable organic waste in an aqueous medium which comprises continuously serially passing an organic waste-containing aqueous medium through a first immobilized microbe bioreactor and a second immobilized microbe bioreactor, in which:

A. The first bioreactor is a hydrolytic redox bioreactor containing a porous inorganic support having a pore diameter distribution of from about 0.8 to about 30μ and microbes immobilized within the pores thereof, in which bioreactor the dissolved oxygen originally present in the aqueous medium is substantially depleted, and

B. the second bioreactor is an anaerobic bioreactor containing a porous inorganic support having a pore diameter distribution of from about 0.8 to about 30μ and microbes immobilized within the pores thereof, in which bioreactor oxygen is substantially absent.

20. A method for processing biodegradable organic waste in an aqueous medium which comprises serially passing an organic waste-containing aqueous medium through a first immobilized microbe bioreactor and a second immobilized microbe bioreactor, in which:

A. the first bioreactor is a hydrolytic redox bioreactor containing a porous inorganic support which is suitable for the accumulation of a biomass, and

B. the second bioreactor is an anaerobic bioreactor comprising a controlled-pore, hydrophobic inorganic membrane which contains a porous inorganic support which is suitable for the accumulation of a biomass, in which at least about 90 percent of the pores of the inorganic membrane have diameters of from about 100 Å to about 10,000 Å.

4,321,142

COMPOSITION AND METHOD FOR STIMULATION OF AEROBIC BACTERIA

Jerry Starr, Holtville, Calif., assignor to Biohumus, Inc., Holtville, Calif.

Continuation-in-part of Ser. No. 86,934, Oct. 22, 1979, Pat. No. 4,246,100. This application Sep. 15, 1980, Ser. No. 184,401
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ C02F *3/02*; C12N *1/38*; C05F *11/02*
U.S. Cl. 210—610 7 Claims

3. A method for the treatment for sewage to stimulate the growth of aerobic bacteria comprising mixing with said sewage at least about 40 ppm. based on the weight of said sewage of a treating agent comprising the product of combining (1) the liquid product of a first digestion of milch cow excrement with yeast under mild acid conditions and further digestion of liquid portions from the first digestion by the action of algae and solar radiation, (2) at least 0.02% by weight of each of thiamine, riboflavin and niacin based on the weight of said liquid digestion product to activate aerobic bacteria-stimulating action and (3) at least 0.4% by weight of magnesium chloride.

4,321,143

TREATING EFFLUENT WITH PEROXIDE AND IRON

Klaus G. Wilms, Dormagen, and Helmut Waldmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,526
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927911
Int. Cl.³ C02F *1/72*
U.S. Cl. 210—631 3 Claims

1. In the process for decreasing the COD-content of effluent by treating with hydrogen peroxide in the presence of a transition metal compound, the improvement which comprises bringing the pH of the effluent to from about 4 to 5, adding to the effluent about 55 to 63% of the calculated quantity of H_2O_2 required for the total oxidation of the total COD-content of the effluent, the transition metal comprising iron and being dissolved in the effluent in an amount such that the molar ratio of H_2O_2 to iron is from about 20:1 to 10:1, maintaining the effluent at about 5° to 100° C., adding a base to the effluent to adjust the pH to approximately neutral, separating from the effluent whatever material has flocculated, and thereafter subjecting the effluent to biological degradation.

4,321,144

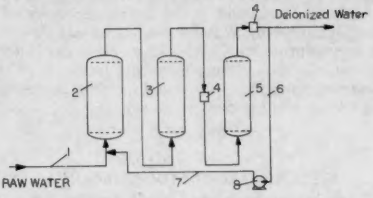
PROCESS FOR PRODUCING FULLY DESALTED PROCESS WATER

Adalbert Huber, Holzwickede, Fed. Rep. of Germany, assignor to UHDE GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 907,921, May 22, 1978, abandoned. This application May 2, 1980, Ser. No. 146,377
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723297
Int. Cl.³ C02F *1/42*
U.S. Cl. 210—661 3 Claims

3. A process for producing fully desalted process water comprising:

a. flowing raw water through a weak acid cation exchanger;
b. subsequently feeding said treated water into a strong acid cation exchanger such that the residual sodium content of the water leaving said exchanger is 0.5 milligrams or less per liter;
c. subsequently feeding said treated water into a second strong acid cation exchanger, wherein the exchanger comprises up to 50 percent suspended bed and the remainder as a solid bed, such that substantially no residual sodium compounds remain in said water leaving said second cation exchanger;
d. subsequently feeding said treated water through a first resin catch such that fine exchanger resin particles are removed from said treated water;
e. subsequently feeding said treated water to a CO_2 scrubbing tower to remove carbonic acid;
f. subsequently increasing the pressure of said scrubbed water through the use of one or more pumps;



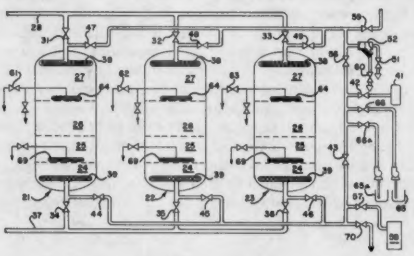
g. subsequently feeding said treated water to a weak basic anion exchanger;
h. subsequently feeding said treated water to a strong basic anion exchanger; and
i. subsequently feeding said treated water through a second resin catch which supplies a fully desalted process water.

4,321,145

ION EXCHANGE TREATMENT FOR REMOVING TOXIC METALS AND CYANIDE VALUES FROM WASTE WATERS

Lee G. Carlson, 8216 Crestview Dr., Willow Springs, Ill. 60480

Filed Jun. 11, 1980, Ser. No. 158,454
Int. Cl.³ B01J *47/04*
U.S. Cl. 210—678 32 Claims



1. Apparatus for removing toxic metals and for recovering cyanide values from waste waters, comprising:

a generally closed ion exchange vessel having a multi-level ion exchange resin bed and a plurality of foraminous members therewithin;
a waste water inlet pipe communicating with the uppermost of said foraminous members;
a treated waste water outlet pipe communicating with the lowermost of said foraminous members;
an upper outlet pipe communicating with an upper intermediate one of said foraminous members located generally below said uppermost foraminous member and above said lowermost foraminous member;
a lower outlet pipe communicating with a lower intermediate one of said foraminous members located generally below said upper intermediate foraminous member;
means for injecting an aqueous backwashing liquor into the ion exchange vessel through one or more of said foraminous members;
means for injecting an acidic regeneration liquor into the ion exchange vessel and through the multi-level ion exchange resin bed;

means for injecting a caustic regeneration liquor into the ion exchange vessel and through at least a portion of the multi-level resin bed;

means for injecting a pressurized fluid into the ion exchange resin bed through one of said foraminous members;

a cyanide recovery unit including a tank in liquid passing communication with at least one of said outlet pipes, said tank including a heating means for driving off hydrocyanic gas from acidic waste regeneration liquid removed from the ion exchange vessel, said tank further including exit means for removing waste water containing toxic metals from said tank;

a reactor means having a holding tank in recirculating communication with an inclined, closed passageway;

conduit means for passing the hydrocyanic gas from the tank into said reactor means and generally upwardly in said inclined passageway;

means for circulating caustic fluid from said holding tank generally downwardly through said inclined closed passageway; and

exit conduit means for recovering cyanide salt formed within said reactor means.

4,321,146

DEMULSIFICATION OF BITUMEN EMULSIONS WITH A HIGH MOLECULAR WEIGHT MIXED ALKYLENE OXIDE POLYOL

David R. McCoy; Robert M. Gipson, both of Austin, Tex., and Kitchener B. Young, Ft. McMurray, Canada, assignors to Texaco Inc., White Plains, N.Y. and Texaco Canada, Inc., Ontario, Canada

Filed May 22, 1980, Ser. No. 152,451
Int. Cl.³ B01D *17/04;* C10G *1/00*
U.S. Cl. 210—708 **5 Claims**

1. A process for recovering petroleum from oil-in-water bitumen emulsions by demulsifying said emulsions by adding thereto a water soluble polyol demulsifier of from about 2 to about 8 functionality said polyol being made by reacting mixed ethylene oxide and propylene oxide with polyol initiators wherein the ethylene oxide content of the polyol demulsifiers is from about 68% to about 95% and the molecular weight of the polyol demulsifier is greater than about 10,000.

4,321,147

DEMULSIFICATION OF BITUMEN EMULSIONS WITH A HIGH MOLECULAR WEIGHT POLYOL CONTAINING DISCRETE BLOCKS OF ETHYLENE AND PROPYLENE OXIDE

David R. McCoy, Austin, Tex., and Colin L. LaBerge, Alberta, Canada, assignors to Texaco Inc., White Plains, N.Y. and Texaco Canada, Inc., Ontario, Canada

Filed May 22, 1980, Ser. No. 152,452
Int. Cl.³ B01D *17/04;* C10G *1/00*
U.S. Cl. 210—708 **5 Claims**

1. A process for recovering petroleum from oil-in-water bitumen emulsions by demulsifying said emulsions by adding thereto demulsifiers of the following general structure:

$$R[[(OR')_l(OR'')_m]_nOH]_x$$

where R is a carbon-containing moiety of from about 4 to about 12 carbon atoms, x is from about 4 to about 8, l and m have average values equal to or greater than about 4 and n is equal to about 1 to 5 and R′ is propylene and/or butylene and R″ is ethylene or alternatively R″ is ethylene and R″ is propylene and/or butylene and wherein the average molecular weight of the demulsifier is above about 12,000 and the weight percent ethyleneoxy in the demulsifier is from about 50 to about 95% said demulsifier being added in amounts effective to demulsify the emulsion.

4,321,148

DEMULSIFICATION OF BITUMEN EMULSIONS

David R. McCoy; Robert M. Gipson, both of Austin, Tex.; Kitchener B. Young, Ft. McMurray, and Colin L. LaBerge, Alberta,both of Canada, assignors to Texaco Inc., White Plains, N.Y. and Texaco Canada, Inc., Ontario, Canada

Filed May 22, 1980, Ser. No. 152,453
Int. Cl.³ B01D *17/04;* C10G *1/00*
U.S. Cl. 210—708 **9 Claims**

1. A process for recovering petroleum from oil-in-water bitumen emulsions by demulsifying said emulsions by adding thereto demulsifiers comprising hydrophilic polyurethanes of greater than about 10,000 molecular weight prepared by reaction under appropriate conditions of temperature and catalysis of a polyisocyanate and a diol or triol containing at least 70% by weight ethyleneoxy units.

6. A process for recovering petroleum from oil-in-water bitumen emulsions by demulsifying said emulsions by adding thereto demulsifiers comprising hydrophilic polyurethanes of greater than 8,000 molecular weight prepared by reaction under appropriate conditions of temperature and catalysis of a polyisocyanate, a diol containing greater than about 80 weight percent ethyleneoxy units and a hydrophobic diol of about 500 or less molecular weight wherein the minimum weight percent ethyleneoxy content of the combined diols is 80 weight percent.

4,321,149

PROCESS FOR REMOVING MULTIVALENT METALS FROM WASTE EFFLUENTS

Margaret H. Hawxhurst, and Walter W. Slobbe, both of Seneca Falls, N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 582,248, May 30, 1975, abandoned. This application Sep. 25, 1978, Ser. No. 945,266
Int. Cl.³ C02F *1/62*
U.S. Cl. 210—720 **10 Claims**

1. A process for removing a multivalent metal M, wherein M is selected from iron and chromium, from an aqueous solution, said process comprising:

(a) reducing the metal to the M^{+2} valence state by the addition of an excess of the theoretical amount of hydrogen peroxide required to reduce said multivalent metal to said M^{+2} valence state and conducting said reduction in the presence of greater than the stoichiometric equivalent amount, based upon the hydrogen peroxide, of a water-soluble organic compound that is a stronger reducing agent than divalent chromium and at a pH of below about 6; whereby said stronger reducing agent reacts with the oxygen liberated by said peroxide reaction and prevents said M^{+2} valence state from reoxidizing to the M^{+3} valence state or higher;

(b) adding a sufficient amount of a water-soluble reactive metal hydroxide source to form $M(OH)_2$ and to increase the pH above about 7; and

(c) removing said $M(OH)_2$ solids from the aqueous solution.

4,321,150

PROCESS FOR WASTEWATER TREATMENT AND WASTEWATER SLUDGE CONVERSION INTO ENERGY

Frederick G. McMullen, 1313 Gypsy Hill Rd., Ambler, Pa. 19002

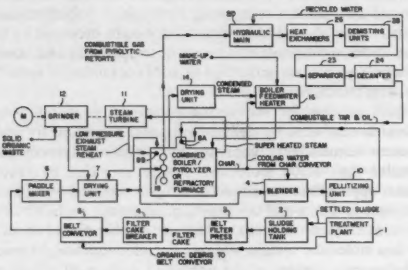
Filed Dec. 7, 1979, Ser. No. 101,128
Int. Cl.³ C02F *11/12*
U.S. Cl. 210—769 **4 Claims**

1. A process for treating wastewater settled sludge and for utilizing the products of the treatment, comprising:

periodically retrieving the wastewater settled sludge in advance of the digestion thereof and thereby preserving the high calorific value of the sludge;

storing and agitating the retrieved settled sludge;

withdrawing and dewatering the stored and agitated settled sludge for producing a filter cake therefrom;
fragmenting the filter cake;
mixing the fragmented filter cake and providing a mixture;
drying the mixture;
decomposing the dried mixture by heating the mixture and thereby evoluting a combustible gas and a residual char, including decomposing a portion of the dried mixture by heating and thereby producing the residual char; utilizing



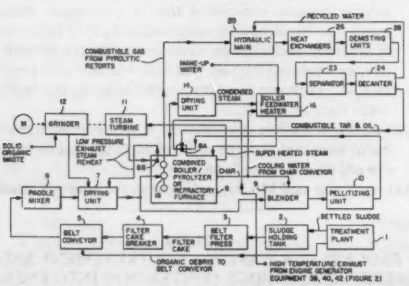
the residual char, including blending another portion of the dried mixture with the residual char, pelletizing the blended dried mixture and residual char, and utilizing the pellets from the pelletizing as an energy source for decomposing the dried mixture by heating:
cleaning the combustible gas to remove residual contaminates therefrom;
utilizing the clean gas; and
utilizing the residual contaminates.

4,321,151

PROCESS FOR WASTEWATER TREATMENT AND WASTEWATER SLUDGE CONVERSION INTO ENERGY

Frederick G. McMullen, 1313 Gypsy Hill Rd., Gwynedd Valley, Pa. 19437

Continuation-in-part of Ser. No. 101,128, Dec. 7, 1979. This application Jun. 9, 1980, Ser. No. 157,898
Int. Cl.³ C02F *11/12*
U.S. Cl. 210—769 **4 Claims**



1. A process for treating wastewater settled sludge and for utilizing the products of the treatment comprising:
periodically retrieving the wastewater settled sludge in advance of the digestion thereof and thereby preserving the high calorific value of the sludge;
storing, thickening and gently agitating the retrieved settled sludge;
withdrawing and dewatering the stored, thickened and agitated sludge for producing a filter cake therefrom;
fragmenting the filter cake;
mixing the fragmented filter cake and providing a mixture;
drying the mixture;
decomposing the dried mixture by heating the mixture in a starved for oxygen atmosphere and thereby evoluting a combustable gas and a residual char, including decomposing a portion of the dried mixture by heating and thereby producing the residual char;
utilizing the residual char, including blending another portion of the dried mixture with the residual char, pelletizing the blended dried mixture and residual char, and utilizing the pellets from the pelletizing as an energy source for decomposing the dried mixture by heating;
utilizing the gas as an energy source for a heat engine which produces high temperature exhaust products; and
recycling the high temperature exhaust products for supporting the decomposing of the dried mixture by heating the mixture and thereby evoluting the combustible gas and residual char.

4,321,152

GRINDING OF TITANIFEROUS ORES TO ENHANCE RECOVERY OF TITANIUM DIOXIDE

Gerard M. Sheehan, Savannah, Ga., and Donald E. Knapp, Linthicum, Md., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1980, Ser. No. 199,154
Int. Cl.³ C09K *1/00*; C01G *23/00*
U.S. Cl. 252—1 **15 Claims**

1. A composition which comprises a titaniferous ore and a polyol of the formula:

$$R—C—(R'OH)_3$$

wherein R is alkyl (C_1–C_4), or hydroxyalkyl (C_1–C_4) having up to three hydroxy groups, and wherein R′ is alkylene (C_1–C_4).

9. A method for improving the comminution of a titaniferous ore which comprises adding to said ore a polyol having the formula:

$$R—C—(R'OH)_3$$

wherein R is alkyl (C_1–C_4) or hydroxyalkyl (C_1–C_4) containing up to three hydroxy groups and wherein R′ is alkylene (C_1–C_4), in an amount effective to reduce the particle size of the ore as a result of the comminution.

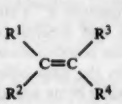
4,321,153

PROCESS OF SULFURIZING TRIGLYCERIDE AND AN OLEFIN

Alexander D. Recchuite, Boothwyn, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Continuation of Ser. No. 220,399, Jan. 24, 1972, which is a continuation-in-part of Ser. No. 135,466, Apr. 19, 1971, abandoned. This application Jun. 18, 1979, Ser. No. 49,864
Int. Cl.³ C10M *1/38, 3/32*
U.S. Cl. 252—48.6 **19 Claims**

1. A process for making a sulfurized composition comprising blending together a triglyceride wherein the fatty acid moieties of said triglyceride contains principally from 9 to 22 carbon atoms and at least about 45 mole percent of the fatty acid moieties present in said triglyceride contain one ethylenically unsaturated carbon-carbon double bond and wherein said fatty acid moieties are hydrocarbons except for the carboxyl group of said fatty acid moieties, with a hydrocarbon containing from 2 to about 24 carbon atoms and having the structure



wherein R^1, R^2 and R^3 and either hydrogen or alkyl and R^4 is either hydrogen, alkyl, aryl, cycloalkyl or alkaryl, to form a blend comprising said triglyceride and said hydrocarbon, the ratio of said hydrocarbon to said triglyceride being in the range from about 50 parts by volume of said hydrocarbon per 50 parts by volume of triglyceride to about 10 parts by volume of said hydrocarbon per 90 parts by volume of triglyceride, adding from 7.5 to 25 wt.% as based on said blend of sulfur, heating the blend at from about 330° F. to about 445° F. for from 20 minutes to 10 hours, followed by blowing with a gas to remove H_2S.

4,321,154

HIGH TEMPERATURE THERMAL INSULATION MATERIAL AND METHOD FOR MAKING SAME

Francois Ledru, Germignan le Taillan Medoc, France, assignor to Societe Europeene de Propulsion, Puteaux, France

Filed Jul. 14, 1980, Ser. No. 168,171

Claims priority, application France, Jul. 19, 1979, 79 18734

Int. Cl.³ C04B *43/00*

U.S. Cl. 252—62 **15 Claims**

1. A thermal insulation material of a density of at least 0.4 g/cm² and a compressive strength of at least 160 kg/cm² comprising fibres selected from the group consisting of highly pure silica fibers, alumina fibers and ceramic fibers and having a melting point higher than 1000° C. bonded in a matrix comprising pyrolytic carbon produced from a synthetic resin, said pyrolytic carbon comprising 18% to 40% by weight of said thermal insulating material.

4,321,155

PIEZOELECTRIC OXIDE MATERIAL

Youhachi Yamashita, Kawasaki; Katsunori Yokoyama, Ebina; Tadashi Ido, Yokohama, and Seiichi Yoshida, Higashitateishi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1981, Ser. No. 235,639

Claims priority, application Japan, Feb. 18, 1980, 55-17911

Int. Cl.³ C04B *35/46*

U.S. Cl. 252—62.9 **4 Claims**

1. A piezoelectric oxide material comprising a basic composition having a general formula

$$(Pb_{1-a}Ca_a[(Co\tfrac{1}{3}W\tfrac{1}{3})_xTi_{1-x}]O_3$$

wherein $0.01 \leqq X \leqq 0.10$ and $0.20 < a \leqq 0.35$, and an additive, of 0.05 to 2.0% by weight of at least one of MnO, NiO and Fe_2O_3 based on the total content of the basic composition; said material exhibiting a thickness coupling factor (Kt) of 50% or more; and a ratio (Kt/Kp) of the thickness coupling factor (Kt) to the planar coupling factor (Kp) of 10 or more.

4,321,156

SHAMPOO COMPOSITION

Donald W. Bushman, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 782,855, Mar. 30, 1977, abandoned. This application May 8, 1979, Ser. No. 36,966

Int. Cl.³ A61K *7/06*; C11D *1/14, 3/04, 17/08*

U.S. Cl. 252—142 **3 Claims**

1. A shampoo composition consisting essentially of from 14 to 21% by weight of an anionic detergent selected from the group consisting of ammonium lauryl sulfate and mixtures of ammonium lauryl sulfate with ammonium lauryl sulfate plus 1 to 10 moles of ethylene oxide, wherein the mixtures are within the range of from 0 to 9 parts ammonium lauryl sulfate plus 1 to 10 moles of ethylene oxide to one part ammonium lauryl sulfate; from 0.25 to 1% by weight citric acid; from 1.4 to 2.75% by weight of ammonium chloride and water; the composition having a pH within the range of from 3.0 to 4.0 and a viscosity of from 5,000 to 10,000 centipoise.

4,321,157

GRANULAR LAUNDRY COMPOSITIONS

Richard G. Harris, Morpeth, and Ian Gray, Gosforth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1980, Ser. No. 202,528

Claims priority, application United Kingdom, Nov. 3, 1979, 38144/79

Int. Cl.³ C11D *9/18, 7/36*

U.S. Cl. 252—174.25 **11 Claims**

1. A granular laundry composition containing from about 0.5% to 100% by weight of a particulate mixture having a pH in 2% aqueous dispersion of from about 2.0 to about 9.0 and comprising:

(a) finely-divided, water-insoluble natural or synthetic silica or silicate having an average primary particle size of less than about 10μ, said natural or synthetic silica or silicate being selected from the group consisting of smectite-type clays, kaolinite-type clays, aluminosilicates of the zeolite type, silica aerogels, amophous aluminosilicates, precipitated silica, silica xerogels, fumed silica, magnesium silicates of the formula $nMgO:SiO_2$ wherein n is from about 0.25 to 4, and mixtures thereof,

(b) finely-divided organic peroxy acid bleach precursor having an average particle size of less than about 500μ in a weight ratio of (a) to (b) of from about 20:1 to about 1:10, and

(c) alkoxylated nonionic surfactant in a weight ratio of (a) to (c) from about 20:1 to about 1:3, said alkoxylated nonionic surfactant being selected from the group consisting of the condensation product of primary or secondary aliphatic alcohols having from 8 to 24 carbon atoms, in either straight chain or branched chain configuration, with from 1 to about 18 moles of alkylene oxide per mole of aliphatic alcohol, and mixtures thereof.

4,321,158

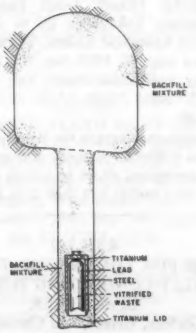
BACKFILL COMPOSITION FOR SECONDARY BARRIERS IN NUCLEAR WASTE REPOSITORIES

Gary W. Beall, Austin, Tex., and Bert M. Allard, Göteborg, Sweden, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1980, Ser. No. 154,639

Int. Cl.³ G21F *9/24*

U.S. Cl. 252—628 **10 Claims**



1. A backfill composition for sorbing and retaining hazardous elements in nuclear wastes comprising 50–70% by weight of quartz, 10–30% by weight of montmorillonite, 1–10% by weight of phosphate mineral, 1–10% by weight of ferrous mineral, 1–10% by weight of a sulfate mineral and 1–10% by weight of attapulgite.

4,321,159

ORGANO TITANIUM CHROMIUM COMPOUND, CATALYST PREPARED THEREFROM AND POLYMERIZATION OF OLEFINS THEREWITH

Wilbur L. Bressler; Kirby Lowery, Jr., and Fred L. Vance, Jr., all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1978, Ser. No. 959,538
Int. Cl.³ C08F 4/64
U.S. Cl. 252—429 B 11 Claims

1. As a composition of matter, the reaction product of a tetravalent hydrocarbyloxy titanium halide or mixture of such compounds and CrO_3 in a mole ratio of CrO_3 to hydrocarbyloxy titanium halide of from about 0.25:1 to about 6:1.

8. A catalyst suitable for the polymerization of an a-olefin or mixture thereof which catalyst comprises:

(a) an inert solid catalyst support containing a metal Ms selected from Mg, Zr, Zn, Si, Ti, and mixtures thereof;

(b) the reaction product of a tetravalent hydrocarbyloxy titanium halide or mixture of such compounds and CrO_3 in a mole ratio of CrO_3 to hydrocarbyloxy titanium halide of from about 0.25:1 to about 6:1; and

(c) an organometallic activating agent containing aluminum which is employed in Ziegler polymerization processes; and wherein the atomic ratio of Ms:Ti is from about 0.1:1 to about 1000:1; the atomic ratio of Al:Ti is from about 0.3:1 to about 2000:1.

4,321,160

METHOD FOR THE ACTIVATION OF PHOSPHOMOLYBDIC ACID BASED CATALYSTS

Diane G. Farrington, Brecksville, Ohio, and James F. White, Westchester, Pa., assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 27, 1979, Ser. No. 107,673
Int. Cl.³ B01J 27/14; C07C 51/61
U.S. Cl. 252—437 11 Claims

1. A method for the activation of PMA based catalysts comprising the step of:

treating the dried salts of a catalyst precursor with a nitrogen-containing compound selected from the group consisting of all oxides of nitrogen gas, nitric acid and nitrous acid and mixtures thereof at a temperature of from about 125° C. to about 400° C.

4,321,161

LIQUID-ABSORBING SHAPED BODY

Yoshiaki Watanabe, Hikari; Genji Taga, Shinnanyo, and Takanori Teshima, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Aug. 15, 1980, Ser. No. 178,295
Claims priority, application Japan, Aug. 18, 1979, 54-104528
Int. Cl.³ B01J 27/02, 37/00, 31/02, 29/00
U.S. Cl. 252—440 13 Claims

1. A shaped body excellent in the liquid-absorbing property, which comprises a fibrous material and an inorganic powder composed of aggregated slices in which the volume of fine pores having a pore radius less than 0.5μ is at least 2.5 cc/g.

4,321,162

PROCESS FOR THE PREPARATION OF AN ELECTRICALLY CONDUCTING THERMOPLASTIC ELASTOMER

Joseph H. M. Guffens, Geleen, and Christiaan A. Van Gunst, Sittard, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 23, 1977, Ser. No. 835,894
Claims priority, application Netherlands, Sep. 25, 1976, 7610673
Int. Cl.³ H01B 1/06
U.S. Cl. 252—511 18 Claims

1. A process for preparing an electrically conducting, thermoplastic elastomer mixture by forming a mixture comprising in parts by weight:

(a) about 100 parts of a thermoplastic elastomer composed of:

(i) 30% to 80% by weight of a substantially amorphous ethene-α-alkene copolymer having an X-ray crystallinity of less than 4% by weight and a tensile strength of at least 10 kg/cm², and

(ii) 20% to 70% by weight of a substantially crystalline block copolymer of propene and ethene having an ethene content of between 1 and 25% by weight and an X-ray crystallinity greater than 25% by weight, and

(b) from about 1 to about 15 parts of carbon black having an oil (DBP) absorption greater than 200 ml/100 g and a porosity index greater than 100 m²/g.

4,321,163

LITHIUM NITRIDE OF INCREASED CONDUCTIVITY, METHOD FOR ITS PREPARATION, AND ITS USE

Jochen Wahl, Immenstaad, and Alfred Breitschwerdt, Stuttgart, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft, Gottingen, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,714
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1978, 2850460
Int. Cl.³ H01B 1/06
U.S. Cl. 252—518 11 Claims

1. Crystalline lithium nitride of increased conductivity comprising 0.2 to about 8 mole percent of hydrogen, a sodium, potassium, and calcium content each of less than 10^{-2} weight percent and a silicon and iron content each between 10^{-2} to 10^{-3} weight percent, the metallic lithium from which said crystalline lithium nitride was prepared having been of at least 99.9 weight percent purity.

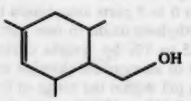
4,321,164

2,4,6-TRIMETHYLCYCLOHEXANEMETHANOL AND DERIVATIVES, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 82,076, Oct. 5, 1979, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Oct. 9, 1980, Ser. No. 195,629
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 1 Claim

1. A process for augmenting or enhancing the spicy aroma of a perfume composition or cologne comprising the step of intimately admixing with a perfume base or a cologne base from 0.5% up to 50% by weight of said perfume composition or said cologne of 2,4,6-trimethyl-3-cyclohexene-1-methanol having the structure:



4,321,165

DETERGENT COMPOSITIONS COMPRISING CATIONIC, ANIONIC AND NONIONIC SURFACTANTS

Rory J. M. Smith, Rowlands Gill, and Allan C. McRitchie, Blyth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 919,537, Jun. 26, 1978, abandoned. This application May 30, 1980, Ser. No. 154,717

Claims priority, application United Kingdom, Jun. 29, 1977, 27275/77

Int. Cl.³ C11D *1/86, 1/65*

U.S. Cl. 252—528 9 Claims

1. A solid particulate detergent composition comprising:

(a) from 2% to 60% of a surfactant system consisting essentially of a water-soluble combination of anionic, alkoxylated nonionic and quaternary ammonium cationic surfactants, wherein the anionic:cationic surfactant weight ratio is no more than 5:1 and the nonionic:cationic surfactant weight ratio is in the range from 100:1 to 2:3 and wherein the surfactant system contains anionic and cationic surfactants in an equivalent ratio of at least 1:1, wherein said quaternary ammonium cationic surfactant is selected from the group consisting of quaternary ammonium salts having one fatty alkyl group containing from 12 to 14 carbon atoms and three groups which are methyl or benzyl with no more than one of said groups being benzyl, and mixtures of said salts;

(b) at least 10% of detergency builder.

4,321,166

LIQUID DETERGENT COMPOSITIONS CONTAINING CORROSION INHIBITING SYSTEM

Joseph McGrady, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 973,254, Dec. 26, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,555

Int. Cl.³ C11D *3/28, 1/83*

U.S. Cl. 252—542 12 Claims

1. An unbuilt detergent composition comprising from about 20% to about 75% of a detergent surfactant; from about 1.0% to about 75% of water; and from about 0.85% to about 2.0% of a corrosion inhibiting system consisting essentially of a mixture of an oligomeric C_{14}–C_{22} olefinic fatty acid and an aromatic triazole selected from the group consisting of benzotriazole, naphthotriazole, compounds in which at least one of the hydrogen atoms in benzotriazole or naphthotriazole is replaced with a substituent each of which is selected from the group consisting of a halogen atom, hydroxy, straight and branched chain C_1–C_4 alkyl, hydroxyalkyl, and alkenyl groups and

wherein R is selected from the group consisting of hydrogen, hydroxy, a halogen atom, and straight and branched chain C_1–C_4 alkyl, hydroxyalkyl, and alkenyl groups, and mixtures thereof, wherein the weight ratio of the fatty acid to the aromatic triazole is about 20:1.

4,321,167

HEAVY DUTY LIQUID DETERGENT COMPOSITIONS CONTAINING ALKOXYLATED ALKYLENE DIAMINES AND FATTY ACIDS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 65,320, Aug. 9, 1979, Pat. No. 4,263,179. This application Dec. 12, 1980, Ser. No. 215,952

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ C11D *3/30*

U.S. Cl. 252—548 4 Claims

1. A heavy-duty liquid detergent consisting essentially of:

(a) an alkalizing amount of 9 to 15 percent of a totally alkoxylated alkylene diamine based upon an initiator alkylene diamine containing 2 to 6 carbon atoms and alkoxylated with an alkylene oxide containing at least 2 carbon atoms,

(b) 40 to 55 percent by weight of surfactants selected from the group consisting of nonionic, anionic, amphoteric, and zwitterionic surfactants,

(c) 0.1 to 5 percent by weight of a fatty acid, and

(d) 28 to 42 percent by weight of solvent.

4,321,168

PROCESS FOR PREPARING RUBBER COMPOSITION FOR TIRE TREADS

Akio Ueda, Yokohama; Shuichi Akita, Kamakura; Hiroshi Hirakawa, Isehara, and Asahiro Ahagon, Hiratsuka, all of Japan, assignors to Nippon Zeon Co., Ltd. and The Yokohama Rubber Co., Ltd., both of Tokyo, Japan

Filed Jan. 30, 1980, Ser. No. 116,887

Claims priority, application Japan, Feb. 5, 1979, 54/11388

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—526 8 Claims

1. A process for preparing a tire tread rubber composition having improved rolling resistance and wet skid resistance comprising [I] 100 parts by weight of a rubber material composed of 25 to 75% by weight of substantially amorphous polybutadiene having a 1,2-bond unit content of 65 to 90 mole% and a Mooney viscosity (ML_{1+4}, 100° C.) of 20 to 100 and 75 to 25% by weight of natural rubber and/or cis-1,4-polyisoprene, and [II] 40 to 70 parts by weight of carbon black, said process comprising (1) mechanically compounding 40 to 60 parts by weight of the rubber material [I] with 40 to 70 parts by weight of carbon black [II], and then (2) adding to the resulting mixture 60 to 40 parts by weight of the rubber material [I] and 30 to 0 parts by weight of carbon black [II] so that the final amount of rubber material (I) is adjusted to 100 parts by weight and the final amount of the carbon black [II] is adjusted to 40 to 70 parts by weight respectively, and mechanically compounding them.

4,321,169

WATER BASED ALKYD RESIN COATING COMPOSITION CONTAINING A POLYISOCYANATE CROSSLINKING AGENT

Lester I. Miller, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 3, 1980, Ser. No. 155,976

Int. Cl.³ C08L *61/32*

U.S. Cl. 524—428 14 Claims

1. In a coating composition comprising of about 40–90% by weight of a film forming binder and about 10–60% by weight of water soluble organic solvent; wherein the binder consists essentially of about

(1) 60–90% by weight, based on the weight of the binder, of an alkyd resin comprising the esterification product of drying oil fatty acids, aromatic polycarboxylic acids and a polyhydric alcohol and having an acid number of about 20–100 and a weight average molecular weight of about 800–15,000 determined by gel permeation chromatography;

(2) 0.5–15% by weight, based on the weight of the binder, of an alkylated melamine formaldehyde resin;
(3) 1–20% by weight, based on the weight of the binder, of an acrylic dispersing resin containing carboxyl groups and
(4) 0.5–5% by weight, based on the weight of the binder, of an organo metallic drier comprising zirconium octoate, cobalt naphthenate and phenanthroline;

the improvement used in combination therewith comprises

(1) about 2–25% by weight, based on the weight of the coating composition, of a polyisocyanate and
(2) about 5–200% by weight, based on the weight of the coating composition, of an aqueous ammonia solution comprising about 0.1–10% by weight ammonia and 90–99% by weight water.

4,321,170
AQUEOUS POLYESTER DISPERSIONS

Karl Zabrocki, Buettgen; Rolf Dhein, Krefeld-Bockum; Franz Weider, Leverkusen; Klaus Höhne, Leverkusen, and Kurt Schorn, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 69,569, Aug. 24, 1979, abandoned. This application Nov. 14, 1980, Ser. No. 206,880

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837552

Int. Cl.³ C08L *61/28, 91/00;* **C09D** *5/02*

U.S. Cl. 524—285 **4 Claims**

1. Aqueous dispersions which are opaque heterogeneous systems and in which an organic resin phase is distributed in water as particles having an average size of from 50 to 3000 nm, which comprises

(A) 25–60% by weight of dispersed alkyd resins or oil-free polyesters having an average molecular weight M_n of from 800 to 6000,
(B) 3–15% by weight of emulsifiers, and
(C) 25–62% by weight of aqueous phase, based in each case on the sum of components (A), (B), and (C) characterized in that the alkyd resin or oil-free polyester (A) has an acid number of from 3 to 25 and the acid component of the alkyd resin or oil-free polyester (A) consists of

(a) 10–100 mol % of condensed residues of polybasic carboxylic acids having 4–30 C-atoms in which the carboxyl groups are attached to secondary and/or tertiary C-atoms which do not form part of an aromatic system and are not linked to other C-atoms through a multiple bond,
(b) 0–90 mol % of condensed residues of other aliphatic and/or aromatic polybasic carboxylic acids having 4 to 12 C-atoms, and
(c) 0–60% by weight of condensed residues of aliphatic, cycloaliphatic and/or aromatic monocarboxylic acids having 6–35 C-atoms, the molar percentages being based in each case on the sum of components (a) and (b) and the percentages by weight of (c) being based on alkyd resin or polyester (A).

4,321,171
POLYMERIZATION PROCESS SHORT STOPPED WITH UNDISPROPORTIONATED ROSIN ACID

James N. Henderson, Hudson, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 18, 1980, Ser. No. 188,422

Int. Cl.³ C08L *93/04;* **C08J** *3/00*

U.S. Cl. 526—84 **3 Claims**

1. A method of forming an elastomer product which comprises (A) organic solvent solution polymerizing at least one olefin monomer in the presence of an organometallic catalyst to form an elastomeric polymer or copolymer, (B) shortstopping the reaction with about a 10 to about a 50 mole percent stoichiometric excess of a rosin acid which has not been submitted to a disproportionation process and therefore a majority of its carbon-to-carbon double bonds are conjugated, and (C) recovering the elastomer product containing the rosin acid from the polymerizate.

4,321,172
ORGANIC POLYMERS WITH ACYLUREA REPEATING UNITS HAVING TERTIARY AMINO GROUPS PENDANT THEREFROM AND CATHODIC ELECTROCOATING OF SAID POLYMERS

Shiow-Ching Lin, Arlington Heights, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 21, 1980, Ser. No. 171,001

Int. Cl.³ C08L *79/08, 75/02*

U.S. Cl. 524—591 **20 Claims**

1. A polymeric reaction product of

(1) an essentially isocyanate-free organic polymer comprising repeating units containing a carbodiimide group, wherein said organic polymer comprising carbodiimide groups is the reaction product of (a) an aliphatic or aromatic diisocyanate and a monoisocyanate, said monoisocyanate end capping said polymer and
(2) an organic compound containing a tertiary amino monocarboxylic acid.

4,321,173
METHOD FOR THE PREPARATION OF FINELY DISPERSED POLYURETHANE UREAS

Günter Schuhmacher; Bertram Freudenberg, both of Weinheim, and Horst Mühlfeld, Grasellenbach-Wahlen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,955

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906159

Int. Cl.³ C08L *75/06*

U.S. Cl. 525—453 **13 Claims**

1. A method for the preparation of finely dispersed polyurethane ureas having a melting range of from about 90° to about 200° C. and a particle size below about 100 μm, comprising the steps of:

(a) preparing a polyurethane by reacting a diisocyanate, a polyester and a mixture of at least three diols, wherein at least one of said diols has alkyl side chains or includes an ether group, and wherein at least one of said diols is unbranched, said diols in said mixture having a molecular weight of from about 62 to about 500, and said polyurethane having a free isocyanate group content which comprises from about 10 to about 40 mole percent of the isocyanate content of the starting mixture, followed by
(b) adding an emulsifier to said polyurethane, and adding water at a temperature above about 70° C. to said polyurethane and emulsifier, wherein the amount of water added to said polyurethane is adapted to provide a water-in-oil emulsion of said polyurethane in water, followed by
(c) adding water at a temperature of about 15° C. to about 25° C. to said emulsion to provide an oil-in-water emulsion, and treating said oil-in-water emulsion with a chain extending diamine or diamine mixture.

4,321,174
PRODUCTION OF AQUEOUS DISPERSION OF AROMATIC POLYETHERSULPHONE

Leslie R. J. Hoy, St. Neots, and Peter S. Westgate, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

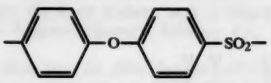
Filed Jan. 5, 1981, Ser. No. 222,684

Claims priority, application United Kingdom, Jan. 21, 1980, 1888/80

Int. Cl.³ C08L *81/06*

U.S. Cl. 523—101 **16 Claims**

1. A method of preparing an aqueous dispersion of an aromatic polyethersulphone of sole repeat unit:



which method comprises

(1) mixing the polyethersulphone with methylene chloride and stirring the mixture so that it first forms a solution and then a coarse particulate solid,

(2) adding further methylene chloride to provide a slurry of the solid in methylene chloride,

(3) milling the slurry from stage (2) to provide a dispersion which after stages (4) to (6) results in a dispersion of mean polyethersulphone particle size as specified in stage (6),

(4) mixing the dispersion from stage (3) with a liquid which is miscible with methylene chloride and water and does not swell the polyethersulphone,

(5) filtering the dispersion from stage (4) to yield a wet cake of the polyethersulphone and washing the wet cake with the liquid which is miscible with methylene chloride and water and then with water, and

(6) dispersing the wet cake from stage (5) in water in the presence of an emulsifying agent to provide an aqueous dispersion of the polyethersulphone having mean particle size below 25 μm.

4,321,175

COPOLYMER DISPERSIONS

Adolf Schmidt, Cologne, and Werner Clarenz, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,418

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854491

Int. Cl.³ C08F *220/06, 2/26*

U.S. Cl. 524—555 **1 Claim**

1. A finely divided aqueous dispersion having an average particle diameter ranging from 0.1 to 0.15μ and a solids content of from 40 to 50% by weight of at least one copolymer of copolymerized units of:

(A) 20 to 48% by weight of acrylonitrile in which 40 to 60% by weight of the given quantity of acrylonitrile may be replaced by styrene,

(B) 47.5 to 70.5% by weight of n-butyl acrylate,

(C) 3.5 to 4.5% by weight of methacrylic acid or of a mixture of methacrylic and acrylic acid comprising not more than 50% by weight of acrylic acid, and

(D) 0 to 5% by weight of N-methoxymethyl-methacrylamide, in which the sum of the percentages is 100, obtainable by emulsion polymerization with exclusion of air and with stirring until virtually complete conversion of the monomers at temperatures of 30° to 70° C. in the presence of an emulsifier and of a water-soluble initiator system with the addition of part of the monomers (A) to (D), part of the emulsifier dissolved in water and part of the initiator system dissolved in water to an initially introduced mixture of water, monomer mixture and emulsifier after polymerization has been released obtainable by the combination of the following measures and the following components

I.

(a) 59.7 to 48.4% by weight of water ($p_{H_2O\ total}$) wherein $p_{H_2O\ total} = p_{H_2O\ E.v.} + p_{H_2O\ Ox.v.} + p_{H_2O\ Red.v.} + p_{H_2O\ e.n.} + p_{H_2O\ Ox.n.} + p_{H_2O\ red.n.}$,

(b) 40.0 to 50.0% by weight of monomer mixture $p_{Mon.total}$ of components (A) to (D), wherein $p_{Mon.total} = p_{Mon.v.} + o_{Mon.n.}$,

(c) 0.25 to 2.0% by weight of emulsifier $p_{E.total}$, wherein $p_{E.total} = p_{E.v.} + p_{E.n.}$, and

(d) 0.025 to 0.4% by weight of an initiator system $p_{I.total}$, wherein

$p_{I.\ total}$ stands for $p_{I.v.} + p_{I.n.} = p_{Ox.v.} + p_{Red.v.} + p_{Ox.n.} + p_{Red.n.} = p_{Ox.\ total} + p_{Red.\ total}$,

wherein the initiator system $p_{I.\ total}$ consists of potassium or ammonium peroxidisulphate or a mixture thereof or of the aforementioned persulphates and sodium or potassium pyrosulphite or a mixture thereof, wherein the emulsifier is the ammonium salt of the acid sulphuric acid ester of the addition product of an average of 10 mol of ethylene oxide and 1 mol of lauryl alcohol, and wherein the composition of the monomer mixture of monomers (A) to (D) corresponds to the integral composition of the desired copolymer, and the sum of the percentages by weight of components **1***a* to **1***d* is 100;

II.

(a) The ratio $k_{Mon.}$ of the quantity of monomers initially introduced into the reaction vessel, $p_{Mon.v.}$, to the sum of the quantity of monomers initially introduced and the total quantity of water initially introduced in the $p_{H_2O\ v.\ total} = p_{H_2O\ E.v.} + p_{H_2O\ Ox.v.} + p_{H_2O\ Red.v.}$ amounts to:

$$k_{Mon.} = \frac{p_{Mon.v.}}{(p_{Mon.v.} + p_{H_2O\ v.\ total})} \times 100 = 5.0\text{–}20,$$

(b) The concentration $[E]_v$ of the quantity of emulsifier initially introduced $p_{E.v.}$ in the total quantity of water initially introduced, $p_{H_2O\ v.\ total}$ amounts to:

$$[E]_v = \frac{p_{E.v.}}{p_{H_2O\ v.\ total}} \times 1000 = 2\text{–}40,$$

(c) The concentration $[I]_v$ of the quantity of initiator initially introduced $p_{I.v.} = p_{Ox.v.} + p_{Red.v.}$, in the total quantity of water initially introduced, $p_{H_2O\ v.\ total}$, amounts to:

$$[I]_v = \frac{p_{I.v.}}{p_{H_2O\ v.\ total}} \times 1000 = 0.5\text{–}4$$

(d) The proportion by weight k_I of pyrosulphite to persulphate has a value in the following range:

$$k_I = \frac{p_{Red.total}}{p_{Ox.total}} \quad 0\text{–}4,$$

wherein the value 0 is applicable at polymerization temperatures above 55° C. to 70° C. and the values >0 to 4 are applicable at polymerization temperatures in the range of 30°–70° C.,

(e) The proportion by weight $v_{Mon.}$ of the quantity of monomer initially introduced to the total quantity of monomer used has been fixed at the following values:

$$v_{Mon.} = \frac{p_{Mon.v.}}{(p_{Mon.v.} + p_{Mon.n.})} \times 100 = 2\text{–}15, \text{ and}$$

III. The mixture initially introduced, consisting of components $p_{H_2O\ E.v.} + p_{Mon.v.} + p_{E.v.}$ is heated to the desired polymerization temperature which lies in the range of from 30° to 70° C., components $p_{Ox.v.}$ dissolved in $p_{H_2O\ Ox.v.\ and\ pRed.v.}$ dissolved in $p_{H_2O\ Red.v.}$ are added simultaneously but separately, and a constant polymerization temperature has been maintained, if necessary with cooling, and the remaining components, $p_{Mon.m.}$, $p_{E.n.}$, dissolved in $p_{H_2O\ E.n.\ and\ pI.n.} = p_{Ox.n.} +$ Red.n. dissolved in $p_{H_2O\ Ox.n.}$ and $p_{H_2O\ Red.\ n.}$ have been continuously added to the polymerizing mixture in the course of 2 to 8 hours and the mixture has subsequently been stirred 2–4 hours at the polymerization temperature.

4,321,176
EMULSION POLYMERIZATION IN WATER-INSOLUBLE POLYOL

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 10, 1980, Ser. No. 111,076
Int. Cl.³ C08F *2/26*
U.S. Cl. 524—555 **7 Claims**

1. A method of forming a latex coating composition comprising, forming an aqueous emulsion of liquid droplets of water-insoluble propylene oxide polyol adduct of a bisphenol with the aid of a surfactant, incorporating monoethylenically unsaturated monomers to be copolymerized in said polyol emulsion, at least about 80% of said monoethylenically unsaturated monomers being nonreactive, and maintaining conditions of elevated temperature and catalysis causing polymerization of said monomers to cause said monomers to polymerize in association with said polyol, said polyol being used in an amount of about 1% to about 25%, based on the weight of the materials which are copolymerized.

4,321,177
SPRAYABLE PERFLUOROALKOXY SOLUTIONS

James H. Wilkinson, 402 Poplar Ave., Williamstown, W. Va. 26187

Filed Aug. 12, 1980, Ser. No. 177,496
Int. Cl.³ C08L *27/18*; B05D *1/02*; B32B *27/00*
U.S. Cl. 524—375 **5 Claims**

1. A sprayable perfluoroalkoxy resin solution, comprising by weight:

from about 5 to about 25 parts of an aromatic solvent, and wherein said aromatic solvent is xylene or toluene,

from about 3 to about 15 parts of a binding agent, and wherein said binding agent is glycerine,

from about 2 to about 13 parts of a surface active agent, and wherein said surface active agent is an alkyl phenol ethylene oxide condensate product having from 12 to 15 moles of ethylene oxide,

from about 11 to about 70 parts of water, and

from about 10 to about 50 parts of a perfluoroalkoxy resin.

4,321,178
WATER-RESISTANT BLACK FLEXOGRAPHIC INK

Eugene L. Miller, Chicago, Ill., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 24, 1980, Ser. No. 200,189
Int. Cl.³ C08L *00/00*
U.S. Cl. 524—159 **2 Claims**

1. The ammonium salt of Nigrosine Sulfonic Acid.

2. In a water-based, water-resistant black flexographic ink composition, the improvement comprising using as a colorant therein, the ammonium salt of Nigrosine sulfonic Acid.

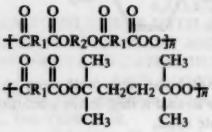
4,321,179
PROCESS FOR PRODUCING AN AQUEOUS LIQUID DISPERSION OF POLYMERS

Hiroshi Ohmura, Aichi, and Masaharu Nakayama, Nagoya, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,465
Claims priority, application Japan, Nov. 28, 1979, 54/153873; Nov. 30, 1979, 54/155035; Mar. 22, 1980, 55/36515
Int. Cl.³ C08L *53/00*
U.S. Cl. 524—599 **9 Claims**

1. A method for preparing an aqueous liquid dispersion, in which the dispersion medium is water or a mixture of water and an organic solvent which is soluble in water, which comprises the steps of:

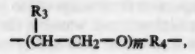
in a first copolymerization step, copolymerizing one or more polymeric peroxides selected from the group consisting of compounds having the formulas (I) and (II),



(I)

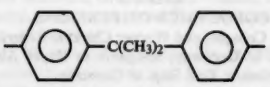
(II)

wherein R_1 is alkylene having 1 to 18 carbon atoms or phenylene, R_2 is (1) alkylene having 2 to 10 carbon atoms,



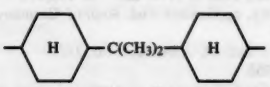
(2)

wherein R_3 is hydrogen or methyl, R_4 is alkylene having 2 to 10 carbon atoms, m is an integer of 1 to 13,



(3)

or



(4)

and n is from 2 to 20,

with a first vinyl monomer component A which is copolymerizable with said polymeric peroxides and consists essentially of from 5 to 40 percent by weight of one or more vinyl carboxylic acid monomers and the balance is one or more, first, vinyl monomers free of carboxyl groups, thereby obtaining copolymers having carboxyl groups and peroxy bonds therein;

then neutralizing more than 50 mole percent of the carboxyl groups of said copolymers with an organic amine or an inorganic alkali;

then, in a second, block copolymerization step, subjecting said copolymers having peroxy bonds therein to block copolymerization, in the presence of said dispersion medium, with a second monomer component selected from the group consisting of (1) vinyl monomer component B which is copolymerizable with said copolymers having peroxy bonds therein and consists essentially of one or more, second, vinyl monomers, said second vinyl monomer being free of carboxyl groups and polymers of said second vinyl monomers being insoluble in said dispersion medium, and (2) vinyl monomer component C which is copolymerizable with said copolymers having peroxy bonds therein and consists essentially of a mixture of vinyl monomer component B and one or more, third, vinyl monomers, said third vinyl monomers being different from said vinyl monomer component B and polymers of said third vinyl monomers being soluble in said dispersion medium, and wherein the polymers of said vinyl monomer component C are insoluble in said dispersion medium,

and thereby obtaining block copolymers dispersed in said dispersion medium.

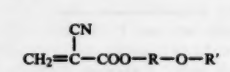
4,321,180

ADHESIVE COMPOSITION

Kaora Kimura, and Kyoji Sugiura, both of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 209,253
Claims priority, application Japan, Dec. 24, 1979, 54/166932
Int. Cl.³ C08F *120/36*
U.S. Cl. 524—549 12 Claims

1. An adhesive composition consisting essentially of (A) an alkyloxyalkyl 2-cyanoacrylate represented by the general formula,



wherein R is an alkylene group having 2 to 4 carbon atoms and R′ is an alkyl group having 2 to 6 carbon atoms, or tetrahydrofurfuryl 2-cyanoacrylate, (B) 300 to 2,000 ppm. of moisture, (C) a radical-polymerization inhibitor, and (D) an anionic-polymerization inhibitor.

4,321,181

THICKENED BUTADIENE-STYRENE LATICES

Eugene S. Barabas, 41 Stanie Brae Dr., Watchung, N.J. 07060; Andrew Klein, 18 S. Cadillac Dr., Somerville, N.J. 08876, and Dru W. Alwani, 40 Heights Rd., Wayne, N.J. 07470

Division of Ser. No. 770,197, Feb. 18, 1977, Pat. No. 4,128,520.
This application Sep. 15, 1978, Ser. No. 942,643
The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.
Int. Cl.³ C08L *33/02*
U.S. Cl. 524—521 2 Claims

1. A butadiene-styrene latex containing an effective thickening amount of a terpolymer emulsion prepared by inducing in a reactor, at a temperature of about 5° C. to about 80° C., a redox-initiated polymerization in an aqueous dispersion of, as monomers, (1) about 30 to about 85 wt% of methacrylic acid (2) about 5 to about 50% wt of ethyl acrylate, and; (3) about 0.5 to about 20 wt% of acrylamide, all the ingredients necessary for said polymerization being present in said reactor upon initiation of the polymerization.

4,321,182

STABLE NON-CORROSIVE SOLUTION OF POLYBENZIMIDAZOLE SUITABLE FOR USE IN THE FORMATION OF SHAPED ARTICLES

Robert Davitt, Bergen; Gordon W. Calundann, and Edward C. Chenevey, both of N. Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,652
Int. Cl.³ C08K *5/34, 5/36, 5/17*
U.S. Cl. 524—233 38 Claims

1. A stable non-corrosive solution suitable for the formation of shaped polybenzimidazole articles comprising:

(a) a solvent capable of dissolving the polybenzimidazole which is selected from the group consisting of N,N-dimethylacetamide, N,N-dimethylformamide, dimethylsulfoxide, and N-methyl-2-pyrrolidone,

(b) a polybenzimidazole dissolved in the solvent, and

(c) a minor amount of an organo-lithium compound dissolved in the solvent which is non-corrosive and is capable of inhibiting the separation of the solution into phases of greater and lesser concentrations of the polybenzimidazole upon the passage of time with said organo-lithium compound being selected from the group consisting of RCO_2Li, RSO_3Li, $ROSO_3Li$, and mixtures of any two or all three of the foregoing, wherein R is a hydrocarbon radical having 1 to 50 carbon atoms.

4,321,183

SOLID GOLF BALL CENTER WITH BLOCK BUTADIENE-STYRENE POLYMERS

Alvon R. Cox, Ashland, and Thomas A. Molyneaux, Englewood, both of Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 945,950, Sep. 26, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 155,254
Int. Cl.³ C08L *53/02*
U.S. Cl. 524—423 8 Claims

1. A solid golf ball center having a substantially spherical form with high rebound capabilities comprising:

(a) a noncross-linked, butadiene-styrene radial block copolymer having a butadiene content in the range of about 50% to 85% by weight and a styrene content in the range of about 15% to 50% by weight; and

(b) an inorganic filler material; said filler material composing the major portion by weight not exceeding 80% of said golf ball center, said center being substantially free of curing agents or initiators and said radial block copolymer having a molecular weight of at least 150,000 as measured by gel permeation chromotography.

4,321,184

PROCESS FOR THE PRODUCTION OF ORGANIC ALKALI METAL SILICATE COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 146,474, May 5, 1980, Pat. No. 4,273,908, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,073,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Apr. 6, 1981, Ser. No. 251,132
Int. Cl.³ C08G *61/00*
U.S. Cl. 524—3 13 Claims

1. The process for the production of organic alkali metal compounds and resinous products by mixing and reacting the following components:

A. Oxidated silicon compound in the amount of 50 to 100 parts by weight and selected from the group consisting of hydrated silica, sodium silicate, potassium silicate, natural oxidated silicon compounds containing free silicic acid radicals and mixtures thereof;

B. Alkali metal compound in an aqueous solution in the amount of 50 to 100 parts by weight and selected from the group consisting of sodium hydroxide, potassium hydroxides, alkali metal carbonates selected from the group consisting of sodium carbonate, potassium, and mixtures thereof;

C. Organic compound which is attached to a substituent which will split off during the reaction is a substituted hydrocarbon which contains a substituent selected from the group consisting of halogen acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate oxlate, acid malonate, acid tartrate, acid citrate and mixtures thereof, and is added in an amount wherein the substituted radicals are about equal to the alkali metal readicals.

4,321,185

INK SYSTEM

Osiel H. Benitez, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 160,862, Jun. 19, 1980, abandoned. This application Apr. 20, 1981, Ser. No. 255,878
Int. Cl.³ C08L *75/06*
U.S. Cl. 524—363 12 Claims

1. An ink system comprising a pigment, a first polyester resin, said first polyester resin having a glass transition temper-

ature of 32° F. (0° C.) and above, a second polyester resin, said second polyester resin having a glass transition temperature below 32° F. (0° C.), a polyisocyanate catalyst and a solvent system comprising methyl ethyl keytone and toluol, said polyester resins being dissolved in said solvent system.

12. The ink system of claim 1 wherein said pigment is present in an amount between about 6.5 to 60% by weight of said ink system, on a solids basis.

4,321,186
FOUNDRY REFRACTORY BINDER

George M. Allison, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 9, 1980, Ser. No. 138,941
Int. Cl.³ C08K 3/34
U.S. Cl. 523—139 50 Claims

1. In the casting of metal products using a foundry core or mold comprising finely divided particulate refractory material, the improvement comprising employing a core or mold prepared by admixing said refractory material with a suitable amount of a binder comprising poly(1,3-butadiene) having a vinyl content of at least 40 percent and a molecular weight of no more than about 50,000 to obtain a flowable hardenable foundry composition having a substantially uniform distribution of poly(1,3-butadiene) throughout; forming the hardenable foundry composition into the desired shape; and then curing the hardenable foundry composition.

31. A hardenable foundry composition suitable for forming shaped products useful as foundry cores or molds comprising a suitable amount of a suitable particulate refractory material, and a suitable amount of a binder comprising poly(1,3-butadiene), and optionally a suitable amount of a curing system for said poly(1,3-butadiene); wherein said poly(1,3-butadiene) has a vinyl content of at least about 40 percent and a molecular weight of no more than about 50,000.

4,321,187
PHOSPHINIC ACID FLAME RETARDANTS FOR POLYPHENYLENE ETHER RESINS

Albrecht H. Granzow, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 3, 1980, Ser. No. 165,590
Int. Cl.³ C08K 5/50
U.S. Cl. 524—133 5 Claims

1. A flame-retardant composition comprising a homogeneous blend of polymers containing about 10 to 90 parts by weight polyphenylene ether resin, about 90 to 10 parts by weight rubber-modified polystyrene, and a flame-retarding effective amount about 4 percent or less by weight based on the blend of polymers of a phosphinic acid of the formula:

wherein R and R′ are the same and are isobutyl or cyclohexyl.

4,321,188
PROCESS FOR PRODUCING SYNTHETIC FLAME RESISTING POLYAMIDES, FLAME RESISTING FILAMENTS AND FIBRES AND PRODUCTS OBTAINED BY USING THE SAME

Ciaperoni Aldemaro, Bollate, and Cappelli Alberto, Cogliate, both of Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa s.p.a., Milan, Italy

Filed Jan. 3, 1980, Ser. No. 109,398
Claims priority, application Italy, Jan. 5, 1979, 19081 A/79
Int. Cl.³ C08K 5/34
U.S. Cl. 524—720 16 Claims

1. A method of producing a flame-resistant synthetic polyamide, suitable for spinning, which comprises reacting melamine with isocyanuric acid in an aqueous environment and in at least a portion of the total amount of monomer to be polymerized, at a temperature suitable for the formation of melamine isocyanurate, thereby obtaining an aqueous suspension of melamine isocyanurate having a maximum granule size not exceeding 2 microns and being substantially free from agglomerates of granules having a maximum size substantially exceeding 2 microns; mixing the remainder, if any, of the monomer to be polymerized, with said aqueous suspension; and subjecting the resultant mixture to polymerization conditions.

4,321,189
FLAME RETARDANT POLYAMIDE MOLDING RESIN CONTAINING MELAMINE CYANURATE FINELY DISPERSED THEREIN

Hiroshi Ohshita, and Tadao Tsutsumi, both of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,690
Claims priority, application Japan, Apr. 12, 1979, 54-44616; DEC. 28, 1979, 54-44617; DEC. 28, 1979, 54-44618; APR. 12, 1979, 54-170338
Int. Cl.³ C08K 5/34
U.S. Cl. 524—101 8 Claims

1. A flame retardant polyamide molding resin which comprises a polyamide and melamine cyanurate finely dispersed therein, and said melamine cyanurate having an average crystallite size (L) of less than 250 A, as determined by x-ray diffraction analysis of the polyamide molding resin calculated according to the following formula:

$$L = \frac{\kappa \cdot \lambda}{\beta^{\circ} \cdot \cos \theta}$$

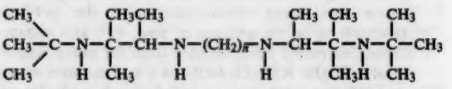
wherein L is the average crystallite size of melamine cyanurate measured along the direction perpendicular to the lattice planes whose spacing is 3.17 A, θ is the diffraction angle of lattice planes whose spacing is 3.17 A, β_0 is the half width of the diffraction peak corresponding to the lattice planes whose spacing is 3.17 A in radian, κ is the constant 1.0 and λ is the wavelength of the employed x-ray in A.

4,321,190
POLYOLEFIN COMPOSITIONS STABILIZED AGAINST UV LIGHT RADIATIONS WITH OPEN-CHAIN HINDERED AMINES

Silvestro Costanzi, S. Giuliano Milanese; Francesco Tessarolo, Monza; Adriano Ballabio, Giussano, and Tito Salvatori, San Donato Milanese, all of Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Dec. 5, 1980, Ser. No. 213,656
Claims priority, application Italy, Feb. 19, 1980, 20000 A/80
Int. Cl.³ C08K 5/17
U.S. Cl. 524—252 4 Claims

1. Polyolefin compositions stabilized against ultraviolet light radiations which contain amine compounds defined by the following general formula:



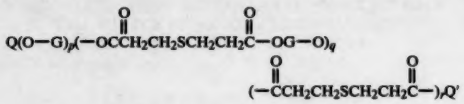
wherein n is an integer comprised between 2 and 12.

4,321,191
STABILIZED COMPOSITION COMPRISING A DIHYDRIC ALCOHOL THIODIPROPIONIC ACID ESTER

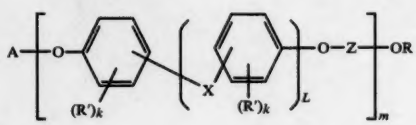
Motonobu Minagawa, Koshigawa; Yutaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

Continuation of Ser. No. 884,559, Mar. 8, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,791
Int. Cl.³ C08K 5/36, 5/13, 5/11, 5/04
U.S. Cl. 524—285 13 Claims

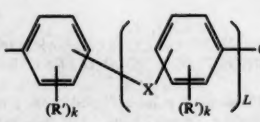
1. A stabilizer composition capable of enhancing the resistance of a synthetic resin to deterioration upon heating, comprising in combination (A) at least one thiodipropionic acid ester of a dihydric alcohol having 2 to 10 carbon atoms and a chain terminator linked to an ester group, the thiodipropionic acid ester being represented by the formula.



in which Q and Q′ are independently selected from the group consisting of hydrocarbyl having 1 to 21 carbon atoms, and alkylthioalkylenecarbonyl having 1 to 18 carbon atoms in the alkyl group and 1 to 2 carbon atoms in the alkylene group; G is a residue of an open chain or cyclic dihydric alcohol having 2 to 10 carbon atoms selected from the group consisting of bivalent hydrocarbon and thiahydrocarbon groups; p and r are 0 or 1 and q is an integer from 1 to 20, provided that q+r is at least 2, and (B) at least one 700 to 10,000 molecular weight carbonate ester of a polyhdric phenol, represented by the formula.



in which independently at each occurrence R′ is selected from the group consisting of alkyl and cycloalkyl radicals; A is selected from the group consisting of hydrogen and —Z—O—R; R is selected from the group consisting of alkyl and



X selected from the group consisting of —S—, —CH_2SCH_2—, and a divalent hydrocarbon radical; Z is

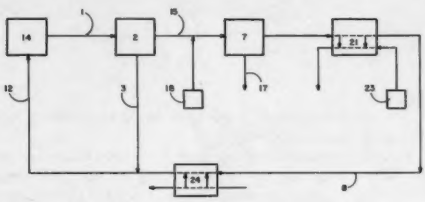
K is an integer from 0 to 2; L is 1; and m is 1 to about 20, the weight ratio of the thiodipropionic acid ester to the carbonate ester being in the range from 2 to 1 to 1 to 1.

11. A stabilized synthetic resin composition comprising a synthetic resin selected from the group consisting of polymers of alpha-olefins having 2 to 4 carbon atoms, acrylonitrile-butadiene-styrene polymers, and terephthalic acid ester polymers, and 0.02 to 10% by weight of the resin of a stabilizer composition according to claim 1.

4,321,192
FRACTIONATION OF PROTEIN MIXTURES BY SALT ADDITION FOLLOWED BY DIALYSIS TREATMENT

Surendar M. Jain, Watertown, Mass., assignor to Ionics Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 111,144, Jan. 10, 1980, Pat. No. 4,276,140. This application Oct. 16, 1980, Ser. No. 197,441
Int. Cl.³ A23J 1/06; A61K 37/04
U.S. Cl. 260—122 1 Claim



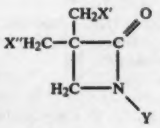
1. A process for separating an aqueous protein mixture into fractions having intrinsically distinguishable compositions comprising removing substantially all the turbidity therefrom, subsequently adding a salting-out agent thereto by passing said mixture into and out of a dialysis apparatus thereby increasing the ionic environment of the said mixture sufficiently to at least partially destabilize one or more proteins in said mixture, allowing said destabilized proteins to form turbidity, subsequently removing substantially all of said turbidity while maintaining the temperature of said mixture during the said separation in the range of between about 0°–40° C. and subsequently removing the salting-out agent by dialysis treatment.

4,321,193
PREPARATION OF N-HALO α,α-DISUBSTITUTED β-LACTAMS

Charles E. Reineke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1978, Ser. No. 870,311
Int. Cl.³ C07D 205/08
U.S. Cl. 260—239 A 3 Claims

1. A process of producing an N-halo α,α-disubstituted β-lactam of the formula:



where X′, X″ and Y are each independently bromo or chloro comprising reacting a 3-halo 2,2-bis(halomethyl) propionamide with an aqueous solution of a hypohalite.

4,321,194
N-SUBSTITUTED AZIRIDINE-2-CARBOXYLIC ACID DERIVATIVES FOR IMMUNO STIMULATION

Elmar Bosies, Weinheim; Herbert Berger, Mannheim; Wolfgang Kampe, Heddesheim; Uwe Bicker, Mannheim, and Alfred Grafe, Mörlenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,863
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833986
Int. Cl.³ C07D *203/08, 203/10, 203/12, 203/14*
U.S. Cl. 260—239 E 4 Claims

1. A method of stimulating an immune response in a patient which comprises administering to the patient an immunostimulating effective amount of an aziridine-2-carboxylic acid derivative of the formula

wherein

X is a carbonyl or nitrile group or an alkoxycarbonyl radical or a carbamoyl group;

R is an alkyl radical having up to 8-C-atoms which is optionally substituted up to three times by halogen, alkoxy, hydroxyl, dialkylamino, cycloalkylamino, carboxylic and sulphonic acid acylamino, carboxylic and sulphonic acid acyl, nitro, alkylthio, alkylsulphinyl, alkylsulphonyl, nitrile, carbalkoxy or carbamoyl radicals or by cycloalkyl radicals optionally substituted up to three times by alkyl, alkoxy or carbalkoxy, or by cycloalkenyl radicals, which can optionally be bridged, or by aryl, aryloxy, arylthio, carboxylic and sulphonic acid acyloxy, or ureido groups, or R is a cycloalkyl or cycloalkenyl radical containing 3 to 10 carbon atoms which is optionally substituted up to three times by alkyl, alkoxy, alkoxycarbonyl or oxo groups and is also optionally bridged by 1 to 3 carbon atoms, or R is an aryl radicals, the aryl radicals being optionally substituted up to three times by halogen, alkoxy, alkyl, hydroxyl, carbalkoxy, dialkylamino, cycloalkylamino, carboxylic and sulphonic acid acylamino, nitro, cyano, carboxylic and sulphonic acid acyl, alkylthio, alkylsulphinyl, sulphamoyl, phenyl, trifluoromethyl, aryloxy, carboxylic and sulphonic acid acyloxy, or methylenedioxy; and

R_1 is a hydrogen atom or a saturated, straight-chained or branched alkyl radical containing up to 4 carbon atoms or a phenyl radical;

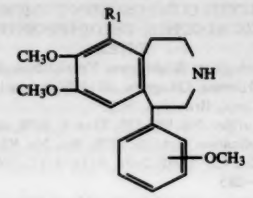
the carboxylic and sulphonic acid acyl radicals referred to hereinabove being selected from the group consisting of formyl, acetyl, benzoyl, furoyl, tosyl and methanesulphonyl.

4,321,195
6-HALO-7,8-DIMETHOXY-1-(METHOXYPHENYL)-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 885,823, Mar. 13, 1978, Pat. No. 4,197,297, which is a continuation-in-part of Ser. No. 742,965, Nov. 17, 1976, Pat. No. 4,160,765. This application May 23, 1979, Ser. No. 41,661
Int. Cl.³ C07D *223/16;* A61K *31/55*
U.S. Cl. 260—239 BB 6 Claims

1. A compound of the structural formula:



in which:

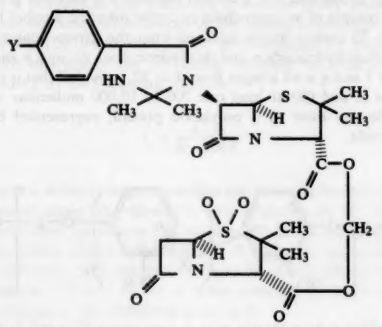
R_1 is halo; together with a nontoxic, pharmaceutically acceptable acid addition salt thereof.

4,321,196
BIS-ESTERS OF METHANEDIOL WITH ACETONIDES OF AMPICILLIN OR AMOXICILLIN AND PENICILLANIC ACID 1,1-DIOXIDE

Thomas C. Crawford, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,504
Int. Cl.³ C07D *499/80*
U.S. Cl. 260—239.1 3 Claims

1. A compound of the formula



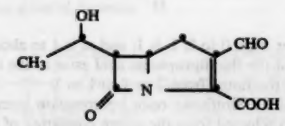
wherein Y is H or OH, and the imidazolidinone sidechain is derived from the D-form of alpha-aminophenylacetic acid; and the pharmaceutically acceptable acid addition salts thereof.

4,321,197
1-CARBA-6-(1-HYDROXYETHYL)-2-CARBONYL-PENEM-3-CARBOXYLIC ACID AND PREPARATION THEREOF

Lovji D. Cama, Cresskill; Ravindra Guthikonda, Edison, and Burton G. Christensen, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 24, 1980, Ser. No. 219,629
Int. Cl.³ C07D *487/04*
U.S. Cl. 260—245.2 T 2 Claims

1. A compound of the formula:



I

and the pharmaceutically acceptable salts thereof.

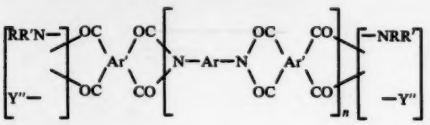
4,321,198

POLYIMIDE DERIVATIVES HAVING ACETYLENIC AMIC ACID GROUPS

Gaetano F. D'Alelio, South Bend, Ind., and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Filed Jan. 25, 1980, Ser. No. 115,485
Int. Cl.³ C07D 403/14, 403/12, 403/10, 519/00
U.S. Cl. 260—326 S 19 Claims

1. A hemi-acid compound of the formula:



wherein:

Ar′ is a tetravalent aromatic benzenoid radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical except that in the case of the Ar′ being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

Ar is a divalent aromatic benzenoid radical;

n or integer of at least one;

R′ is an organic moiety containing 2 to 14 carbon atoms and having a terminal —C≡CH structure said organic moiety consisting of a hydrocarbon radical or two or three hydrocarbon radicals joined by —O—, —SO_2— or —COO— groups;

R is an organic moiety containing one to 20 carbon atoms said organic moiety consisting of a hydrocarbon radical or two or three hydrocarbon radicals joined by —O—, —SO_2— or —COO— groups;

Y″ is —OH or X; and

X is a halogen.

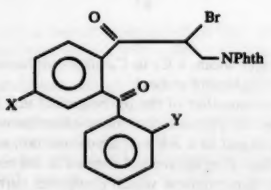
4,321,199

THIAZOLO[5,4-D][2] BENZAZEPINES AND INTERMEDIATES

Rodney I. Fryer, North Caldwell, and Norman W. Gilman, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 161,713, Jun. 23, 1980, Pat. No. 4,269,774. This application Dec. 15, 1980, Ser. No. 216,059
Int. Cl.³ C07D 209/48, 513/04, 417/06; A61K 31/425
U.S. Cl. 260—326 A 1 Claim

1. A compound of the formula .



wherein X and Y are hydrogen or halogen and NPhth is isoindole-1,3(2H)-dione-2-yl.

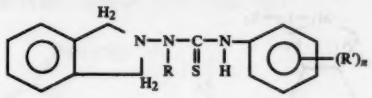
4,321,200

ARYLTHIOUREIDOISOINDOLINES

Charles G. Gibbs, Shawnee Mission, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 124,992, Mar. 13, 1980, Pat. No. 4,272,284. This application Jan. 12, 1981, Ser. No. 224,369
Int. Cl.³ C07D 209/44
U.S. Cl. 260—326.1 23 Claims

1. A compound having the structural formula



in which R is H or CH_3, R′ is halogen, trifluoromethyl, cyano or C_1 to C_3 alkyl or alkoxy and n is zero or an integer from 1 to 2.

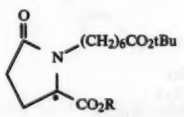
4,321,201

OPTICALLY ACTIVE TERT-ALKYL 7-(2-OXO-5-CARBONYLOXYPYRROLIDINYL) HEPTANOATES

Richard M. Scribner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1980, Ser. No. 189,061
Int. Cl.³ C07D 207/28
U.S. Cl. 260—326.43 3 Claims

1. A compound of the formula



wherein the asterisk means that one enantiomer is predominant and wherein R is a protonated optically-active amine moiety selected from the group consisting of l(−)brucine, l(−) cinchonidine, d(+)dehydroabietylamine, d(+)α(1-naphthyl)ethylamine, l(−)α(1-naphthyl)ethylamine, d(+)epherdrine, l(−)ephedrine, d(+)α-methylbenzylamine, l(−)α-methylbenzylamine.

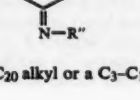
4,321,202

1-METHYL-2(ALKYLIMINO)PYRROLIDINES AND 1-METHYL 2(CYCLOALKYLIMINO) PYRROLIDINES

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 26, 1979, Ser. No. 106,677
Int. Cl.³ C07D 207/22; C07C 123/00
U.S. Cl. 260—326.86 1 Claim

1. The amidine



wherein R″ is a C_1–C_{20} alkyl or a C_3–C_{12} cycloalkyl radical.

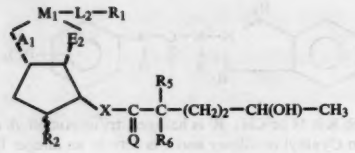
4,321,203

19-HYDROXY-7A-HOMO-PGI$_1$ COMPOUNDS

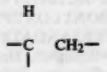
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508.
This application Mar. 3, 1980, Ser. No. 126,480
Int. Cl.^{3} C07D *311/94*
U.S. Cl. 260—345.2 3 Claims

1. A prostacyclin-type compound of the formula



wherein A_1 is —O— (oxa) and E_2 is —CH_2CH_2—;
wherein L_2 is
(1) —$(CH_2)_q$—CF_2—, wherein q is one, 2 or 3; or
(2) —CH=CH—;
wherein M_1 is



wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:β—OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is
(1) —$COOR_3$,
(2) —CH_2OH,
(3) —$CH_2N(R_7)(R_8)$,
(4) —CO—$N(R_7)(R_8)$,
(5) —CO—NH—SO_2—R_{15}, or
(6) tetrazolyl,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{16},
wherein —(Ph)— is inter-phenylene and —(p—Ph) is inter-para-phenylene or para-phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive, wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

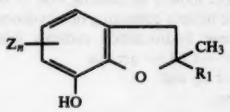
4,321,204

PREPARATION OF CERTAIN 2-METHYL-2,3-DIHYDRO-BENZOFURAN-7-OLS

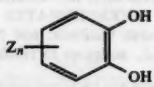
Gerhard Büttner, Pulheim; Karl-Friedrich Christmann, Dormagen; Manfred Lenthe, Odenthal, and Udo Allenbach, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 170,443
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932458
Int. Cl.^{3} C07D *307/86*
U.S. Cl. 260—346.22 8 Claims

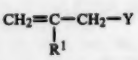
1. In the preparation of a 7-hydroxycoumaran of the formula



in which
Z is a hydrogen atom or a substituent which is inert under the subsequent reaction conditions,
R^1 is a hydrogen atom or a C_1 to C_4-alkyl radical, and
n is 1, 2 or 3
wherein a pyrocatechol of the formula



is reacted with an allyl compound of the formula



in which
Y is a halogen atom, a C_1 to C_4-alkyl-sulphonate radical or an aryl-sulphonate radical,
to form the mono-ether of the pyrocatechol in a first stage, in a second stage the pyrocatechol mono-ether formed in the first stage is rearranged to a 3-alkenylpyrocatechol, and in a third stage the 3-alkenyl-pyrocatechol formed in the second stage is cyclized, the improvement which comprises carrying out the second stage at a pH of about 2–8 and employing a polyhydroxyalkyl ether with at least one OH group as solvent in all three stages.

4,321,205

15-EPI-PROSTACYCLIN AND ANALOGOUS PROSTACYCLINS

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Allesandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Fanstini, and Roberto Ceserani, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

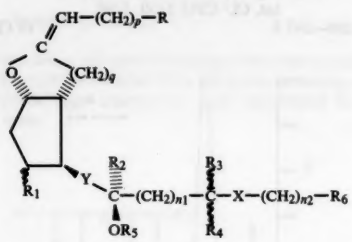
Division of Ser. No. 955,631, Oct. 30, 1978, Pat. No. 4,285,966. This application Apr. 18, 1980, Ser. No. 141,341

Claims priority, application Italy, Nov. 25, 1977, 30029 A/77

Int. Cl.[3] C07D *307/935*

U.S. Cl. 260—346.22 **15 Claims**

1. A 15-epi compound of the formula (I)



(I)

wherein

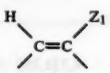
R is —COOR′ wherein R′ is hydrogen or C_1–C_6 alkyl;

p is zero or an integer between 1 and 7;

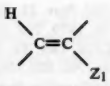
q is 1;

R_1 is hydroxy, C_1–C_6 alkoxy, benzyloxy, alkanoyloxy, or benzoyloxy;

Y is —CH_2—CH_2—,



(cis),



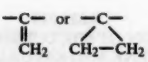
(trans) where Z_1 is hydrogen or halogen;

R_2 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, phenyl, tolyl, α-naphthyl or β-naphthyl;

R_5 is hydrogen, C_1–C_6 alkyl, or benzyl;

n_1 and n_2, whether the same or different, are 0 or an integer between 1 and 6;

R_3 and R_4, whether the same or different, may be hydrogen C_1–C_6 alkyl or fluorine, or may form a



group with a carbon atom to which they are bound:

X is chosen from —O—, —S—, and —$(CH_2)_m$—, where m is 0 or 1;

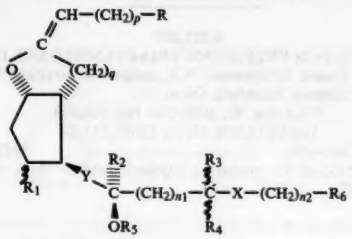
R_6 is a substituent chosen from (a′) hydrogen, (b′) C_1–C_4 alkyl, (c′) C_3–C_9 cycloalkyl, C_3–C_9 cycloalkyenyl, norbornyl or adamantyl radical, optionally substituted with one or more C_1–C_6 alkyl and C_1–C_6 alkoxy groups, (d′) phenyl, tolyl, α-naphthyl or β-naphthyl, optionally substituted with one or more of halogen, C_1–C_6 alkyl, halo-C_1–C_6-alkyl or C_1–C_6-alkoxy; and a pharmacuetically or veterinarily acceptable salt thereof, with the provisos that:

(a) when X is —$(CH_2)_m$— wherein m is as defined above, R′ is hydrogen, Y is —CH=CH— (trans) and R_6 is hydrogen or C_1–C_4 alkyl then R_2 is not C_2–C_6 alkenyl;

(b) when X is O and R_2 is hydrogen, C_1–C_6 alkyl or C_2–C_6 alkenyl, R_6 is α-naphthyl or β-naphthyl, optionally substituted with one or more of halogen, C_1–C_6 alkyl, halo-C_1–C_6-alkyl or C_1–C_6-alkoxy; and

(c) when X is S and R_2 is hydrogen, C_1–C_6 alkyl or C_2–C_6 alkenyl, R_6 is phenyl, tolyl, α-naphthyl or β-naphthyl, optionally substituted with one or more halogen, C_1–C_6 alkyl, halo-C_1–C_6-alkyl or C_1–C_6-alkoxy.

2. A 15-epi compound of the formula (I)



(I)

wherein

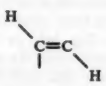
R is —COOR′ wherein R′ is hydrogen;

p is zero or an integer between 1 and 7;

q is 1;

R_1 is hydroxy, C_1–C_6 alkoxy, benzyloxy, alkanoyloxy, or benzoyloxy;

Y is



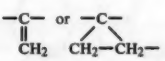
(trans);

R_2 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkynyl, phenyl, tolyl, α-naphthyl or β-naphthyl;

R_5 is hydrogen, C_1–C_6 alkyl, or benzyl;

n_1 and n_2, whether the same or different, are zero or an integer between 1 and 6;

R_3 and R_4, whether the same or different, may be hydrogen C_1–C_6 alkyl or fluorine, or may form a



group with a carbon atom to which they are bound;

X is —$(CH_2)_m$, where m is zero or 1;

R_6 is hydrogen or C_1–C_4 alkyl;

and a pharmaceutically or veterinarily acceptable salt thereof.

4,321,206

ETHYLENE OXIDE PRODUCTION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 930,961, Aug. 4, 1978, Pat. No. 4,206,128, which is a continuation-in-part of Ser. No. 697,088, Jun. 16, 1976, abandoned. This application Jun. 29, 1979, Ser. No. 53,624

Int. Cl.[3] C07D *301/22*

U.S. Cl. 260—348.34 **8 Claims**

1. An improved method for epoxidizing ethylene to ethylene oxide in the vapor phase, which comprises the step of:

intimately contacting ethylene with an epoxidizing amount of a molecular oxygen epoxidizing agent in the presence

of a supported silver catalyst at epoxidizing temperatures from about 200° C. to about 300° C.,

wherein the catalyst is prepared by;

contacting a porous, inorganic catalyst support material with an impregnating solution comprising a silver carboxylate/amine complex; and,

heating the impregnated support material at temperatures from about 50° C. to 300° C. to evaporate volatiles, decompose said complex and activate said catalyst,

wherein said silver carboxylate/amine complex comprises a silver carboxylate dissolved in a solubilizing amount of an amine containing complexing agent and wherein the said complexing agent is tetrahydrofurfurylamine.

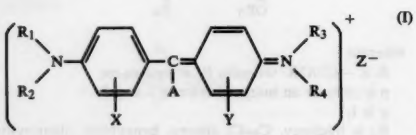
4,321,207

PROCESS FOR PREPARING TRIARYLMETHANE DYES

Frank F. Cesark, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

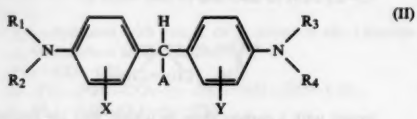
Filed Jun. 30, 1980, Ser. No. 164,639
Int. Cl.³ C09B 11/10; C07D 251/54
U.S. Cl. 260—391 **8 Claims**

1. A process for preparing triphenylmethane dyes of the formula (I)



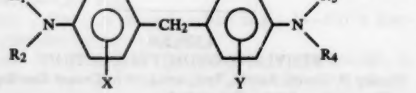
(I)

wherein R_1, R_2, R_3, and R_4 are independently hydrogen, alkyl (C_1–C_6), cycloalkyl (C_5–C_6), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}), or substituted alkyl, cycloalkyl, aryl, or aralkyl wherein the substituents are selected from alkyl (C_1–C_6), alkoxy (C_1–C_6), cyano, carbalkoxy (C_1–C_6), halo or hydroxy, or R_1 and R_2, and/or R_3 and R_4, together with the nitrogen to which R_1 and R_2 and/or R_3 and R_4 are attached form a heterocyclic ring containing 4 or 5 carbon atoms; X and Y are independently hydrogen, halogen, alkyl (C_1–C_6), or alkoxy (C_1–C_6); A is carbocyclic aryl (C_6–C_{10}), or substituted carbocyclic aryl wherein the substituents are selected from alkyl (C_1–C_6), N-alkylamino, N,N-dialkylamino, N-(hydroxyalkyl)amino, N-(alkoxyalkyl)amino, N-cyanoalkylamino, sulfo, carbocyclic aryl (C_6–C_{10}), or heterocyclic aryl (C_5–C_9); and Z^- is an anion; comprising heating a compound, of formula (II)



(II)

or a combination of a compound of formula (III)



(III)

and a compound, of formula (IV)

A—H (IV),

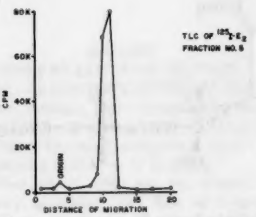
with an oxygen-containing gas under atmospheric or autogenous pressure in the presence of a catalytic amount of a fluoro, chloro, bromo, or cyano-substituted benzoquinone, and an oxygen-activating catalyst comprising a mixture of vanadium and molybdenum, in ionic form, in a solvent medium comprising 20% to 90% by weight of acetic acid and 80% to 10% by weight of a cosolvent selected from the group consisting essentially of 2-ethoxyethyl acetate, chlorobenzene, o-dichlorobenzene, ethyl acetate, 2-ethoxyethanol, 2-methoxyethanol, and toluene, and recovering the reaction mixture containing the dye.

4,321,208

PREPARATION OF DIRECTLY IODINATED STEROID HORMONES AND RELATED COMPOUNDS

Velayudhan Sahadevan, 3825 Golf Rd., Evanston, Ill. 60203

Filed Sep. 27, 1976, Ser. No. 727,284
Int. Cl.³ C07J 5/00, 1/00
U.S. Cl. 260—397.3 **16 Claims**



1. A halogenated steroid hormone suitable for invivo biological studies and treatment prepared by the reaction of a steroid hormone with an alkali metal halide in the presence of an agent selected from the group consisting of hydrogen peroxide and Chloramine-T at ambient temperature.

4,321,209

FLUORINATED AROMATIC POLYENES

Ka-Kong Chan, Hopatcong, and Beverly A. Pawson, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 96,362, Nov. 21, 1979, which is a division of Ser. No. 37,798, May 10, 1979, Pat. No. 4,201,727, which is a division of Ser. No. 952,416, Oct. 18, 1978, Pat. No. 4,169,100, which is a division of Ser. No. 809,738, Jun. 24, 1977, Pat. No. 4,137,246, which is a continuation-in-part of Ser. No. 722,939, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,028, Nov. 14, 1975, abandoned. This application Nov. 12, 1980, Ser. No. 206,197
Int. Cl.³ C07C 63/52
U.S. Cl. 260—408 **2 Claims**

1. Ethyl-7-(4-methoxy-2,3,6-trimethylphenyl)-2-fluoro-5-methyl-2(Z),4(E),6(E)-heptatrienoate.

4,321,210

CONVERSION OF CYCLOPROPENOIDS TO CONJUGATED DIENE AND SATURATED DERIVATIVES

Yoshinori Kai, Atsugi, Japan, and Everett H. Pryde, Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 15, 1981, Ser. No. 263,823
Int. Cl.³ C11C 3/14
U.S. Cl. 260—409 **13 Claims**

1. A method for producing conjugated diene derivatives of a cyclopropenoid compound comprising heating said cyclopropenoid compound in the presence of a rhodium catalyst in an inert atmosphere under conditions suitable for the rearrangement of said compound to said conjugated diene derivatives.

4,321,211
CARBONYLATION CATALYSTS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 17,717, Mar. 5, 1979, abandoned, which is a division of Ser. No. 779,589, May 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 166,615, Jul. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,669, Jul. 1, 1970, abandoned. This application Apr. 11, 1980, Ser. No. 139,151

Int. Cl.[3] B01J *31/22, 31/24;* C07F *15/00, 15/04, 15/06*

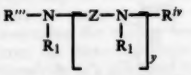
U.S. Cl. 260—429 R 11 Claims

1. A magnesium Group VIII transition metal carbonyl and substituted carbonyl complex having the following formula:

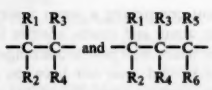
$$B_xMe[Me'(CO)_a(L)_b]_2$$

wherein B is a nitrogen-containing Lewis base compound and being a member selected from the group consisting of:

polyfunctional nitrogenous bases represented by the formula:



wherein R‴ and R^{iv} are selected from the group consisting of hydrogen and C_1 to C_{10} hydrocarbyl radicals, R_1 is selected from the group consisting of hydrogen and C_1 to C_4 alkyl radicals, Z is selected from the group consisting of radicals represented by the formulae:

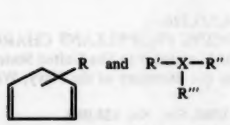


wherein R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen and C_1 to C_4 alkyl radicals and y is a positive integer ranging from 1 to 3;

Me is magnesium;

Me′ is a transition metal selected from the group consisting of the metals of Group VIII of the Periodic Table of the Elements;

L is a uni- or polydentate ligand or hydrocarbon residue which is selected from the group consisting of compounds of the following formula:



wherein R, R′, R″ and R‴ are radicals independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{20} aryl, C_7 to C_{20} aralkyl and alkaryl, and X is selected from the group consisting of N, P, As and Sb; X is a positive integer ranging from 1 to 4;

a is an integer ranging from 1 to 4;

b is an integer ranging from 0 to 3, with the proviso that the sum of a and b is 5 or less.

4,321,212
METHOD FOR PREPARING AN OPTICALLY ACTIVE α-CYANO-3-PHENOXYBENZYL 2-(4-SUBSTITUTED-PHENYL)ISOVALERATE

Yukio Suzuki, Toyonaka; Masachika Hirano, Ibaraki, and Koichi Aketa, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

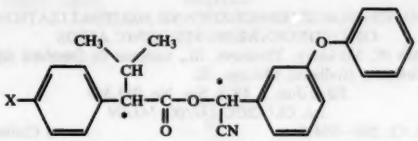
Filed Mar. 24, 1981, Ser. No. 247,035

Claims priority, application Japan, Mar. 24, 1980, 55-38014

Int. Cl.[3] C07C *121/75*

U.S. Cl. 260—465 D 11 Claims

1. A method for preparing an optically active α-cyano-3-phenoxybenzyl-2-(4-substituted-phenyl)isovalerate of the formula:



wherein X is a methoxy group which may be unsubstituted or substituted with a fluorine atom or atoms, or an ethoxy group which may be unsubstituted or substituted with a fluorine atom or atoms, and * indicates an asymmetric carbon atom, comprising (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-substituted-phenyl-)isovalerate, substantially free of other isomers, which method comprises crystallizing said compound from a solution of the compound of said formula having an (S)-configuration on the acid moiety with or without being seeded with crystals in the presence or absence of a basic catalyst, and separating the crystal of said compound from the mother liquor.

4,321,213
2,4,4′-TRIMETHYLPENTYL, CYCLOHEXYLPHOSPHINIC ACID AND ITS PREPARATION

Allan J. Robertson, Niagara, Canada, assignor to Cyanamid Canada, Inc., Willowdale, Canada

Filed May 14, 1981, Ser. No. 263,459

Int. Cl.[3] C07F *9/30*

U.S. Cl. 260—502.4 R 1 Claim

1. The compound 2,4,4′-trimethylpentyl, cyclohexylphosphinic acid.

4,321,214
EXTREME PURIFICATION OF SULFONIC-TYPE ACIDS FOR PROCESSING TO HIGHLY OVERBASED METAL SULFONATES

Charles F. Nicolet, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 662,975, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,887, Mar. 28, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,014

Int. Cl.[3] C07B *13/00;* C07C *143/24*

U.S. Cl. 260—504 R 8 Claims

1. A process for the purification of crude, oil soluble alkyl benzene sulfonic acid or polyalkenyl sulfonic acid which comprises:

a. contacting the crude oil soluble alkyl benzene sulfonic acid or polyalkenyl sulfonic acid with an amount of water to form a separate aqueous phase containing less than about 85 percent by weight of sulfuric acid and preferentially water soluble sulfonic acid;

b. separating said aqueous phase from the partially purified oil soluble alkyl benzene sulfonic acid or polyalkenyl sulfonic acid;

c. contacting the partially purified oil soluble alkyl benzene

sulfonic acid or polyalkenyl sulfonic acid with calcium carbonate to neutralize residual sulfuric acid and form a solid phase containing calcium sulfate, calcium carbonate and adsorbed impurities, and further characterized by being substantially free of calcium sulfonate, but not neutralizing significant amounts of sulfonic acid;

d. separating the solid phase from the purified sulfonation reaction mixture; and

e. recovering the purified oil soluble alkyl benzene or polyalkenyl sulfonic acid substantially free of sulfuric acid and calcium sulfate.

4,321,215

PROCESS FOR EXTRACTION AND NEUTRALIZATION OF HYDROCARBON SULFONIC ACIDS

James W. McAbery, Elmhurst, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 1, 1978, Ser. No. 911,365
Int. Cl.[3] C07C *139/00, 143/24*
U.S. Cl. 260—504 S 6 Claims

1. A method for producing ammonium hydrocarbon sulfonate which comprises (1) contacting a sulfonation liquor comprising a hydrocarbon sulfonic acid, unreacted hydrocarbon and SO_3 with an alcoholic extraction medium in which unreacted hydrocarbon is insoluble, (2) separating the insoluble hydrocarbon raffinate from the extraction medium, (3) removing a substantial portion of the extraction medium in a stripping tower to produce sulfonic acid having residual amounts of extraction medium, (4) neutralizing the sulfonic acid with an excess of ammonia reagent to produce an ammonium sulfonate, and heating the ammonium sulfonate to remove residual volatile materials.

4,321,216

POLAR-NONPOLAR SOLVENT SYSTEM FOR DEOILING HYDROCARBON SULFONATES

Emil Delgado, La Grange, Ga., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 22, 1980, Ser. No. 114,447
Int. Cl.[3] C07C *139/00*
U.S. Cl. 260—504 S 4 Claims

1. A process for the separation from a mixture containing the same of a hydrocarbon sulfonate and unsulfonated hydrocarbon which comprises contacting said mixture under phase-forming conditions with an immiscible solvent system comprising an immiscible polar component and a nonpolar component and recovering in said carboxylic acid component hydrocarbon sulfonate substantially freed from unsulfonated hydrocarbon.

4,321,217

DIALKYLATED PHOSPHAZENE OLIGOMERS AND METHOD OF PREPARATION THEREOF

Harry R. Allcock, and Paul J. Harris, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1980, Ser. No. 156,714
Int. Cl.[3] C07F *9/65, 9/56*
U.S. Cl. 260—543 PN 7 Claims

1. A phosphazene oligomer having the formula:

$(NP(X_2))_nNPRR'$, wherein X is selected from the group consisting of chloride, and bromide, R and R' represent a linear or branched or saturated or unsaturated hydrocarbon, and n represents an integer from 2 to 8.

4,321,218

PHOSPHITE STABILIZER

Michael Rasberger, Riehen, and Helmut Müller, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 974,187, Dec. 28, 1978, abandoned.
This application Apr. 30, 1980, Ser. No. 145,072
Claims priority, application Switzerland, Jan. 10, 1978, 224/78
Int. Cl.[3] C07F *9/145;* C08K *5/52*
U.S. Cl. 260—967 1 Claim

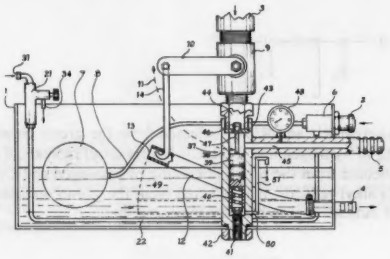
1. Tris-(2,4-di-t-octylphenyl)-phosphite.

4,321,219

STEAM CLEANER

Richard M. Barker, 6/3 Frances St., Randwick, New South Wales 2031, Australia

Filed Dec. 1, 1980, Ser. No. 211,885
Claims priority, application Australia, Dec. 3, 1979, PE1564
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—18 B 9 Claims



1. Steam cleaning equipment comprising a water reservoir with inlet and outlet ports for water and steam, a water level control valve connected to the water inlet port and arranged to maintain a quantity of water in said reservoir between said predetermined limits, a steam pressure regulating valve connected between the steam inlet port and the steam outlet port, said steam pressure regulating valve comprising a cylindrical body, a piston slidable within said body against the action of a biassing means, a choke ring located in a conduit between said steam inlet port and said steam outlet port and a valve head connected to said piston and operatively associated with said choke ring to choke the flow of steam therethrough when the piston is moved in said body against said biassing means, said body being at least partially immersed in the water in said reservoir in use so that steam leaking past said piston is condensed and passes out of the valve body into the reservoir.

4,321,220

METHOD OF REINFORCING PROPELLANT CHARGE

Albert T. Camp, Welcome, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 7, 1980, Ser. No. 128,080
Int. Cl.[3] C06B *21/00*
U.S. Cl. 264—3 R 8 Claims

1. A method for fabricating a double-base propellant charge reinforced with a support structure which comprises:

selecting a flexible, perforated material for said support structure;

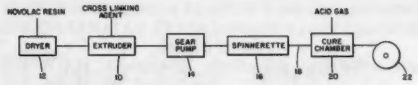
traversing said material through a double-base propellant lacquer; and

drying said material upon removal from said propellant lacquer.

4,321,221
PROCESS FOR CONTINUOUS PRODUCTION OF THERMOSETTING RESINOUS FIBERS

Lawrence J. Broutman, 1037 Edgebrook La., Glencoe, Ill. 60022

Filed Jun. 9, 1980, Ser. No. 157,652
Int. Cl.³ B06B 3/00
U.S. Cl. 264—23 16 Claims



1. The method for the continuous production of thermosetting resinous fibers comprising:
introducing a novolac resin into an extruder in which the novolac resin has a moisture content that does not exceed 1% by weight,
introducing a cross linking agent into the extruder for admixture with the novolac resin,
extruding the mixture at a temperature within the range of 95°–150° C.,
transporting the resinous material in a molten state directly from the outlet from the extruder to a metering pump, conveying the molten resinous material under pressure from the metering pump to a spinnerette for issuance therefrom as a fibrous stream,
subjecting the spinnerette to ultrasonic vibration to minimize the coefficient of friction and contact between the walls of the spinnerette and the molten resin while being processed therethrough,
exposing the fibrous stream issuing from the spinnerette to cure in an atmosphere of a curing agent in a vapor state selected from the group consisting of an acid vapor or gas, formaldehyde and paraformaldehyde and mixtures thereof at a pressure withing the range of 1–10 atmospheres
for cure of the resinous fibers.

4,321,222
METHOD OF MANUFACTURING PLASTIC-BONDED ANISOTROPIC PERMANENT MAGNETS

Manfred Moslener, deceased, late of Tangstedt, Fed. Rep. of Germany, and by Gerhard A. Gentemann, administrator, Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

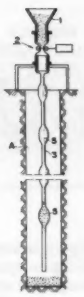
Filed May 24, 1979, Ser. No. 42,268
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823054
Int. Cl.³ B29F 5/00
U.S. Cl. 264—24 7 Claims

1. A method of manufacturing plastic-bonded anisotropic permanent magnets comprising the steps of:
transforming a plastic binder into a plastic state;
admixing, with the plastic binder, agglomerates of permanent magnetic oxide material having an easy axis of magnetization;
admixing, with the plastic binder, single magnetic domain particles of permanent magnetic oxide material;
applying a magnetic field to the mixture so as to orient the magnetic domains in the agglomerates and the single magnetic domain particles in a substantially uniform direction; and;
molding the mixture into a desired form;
characterized in that the agglomerates have an average size of from 300–1,000 microns, the single magnetic domain particles have an average size up to approximately 2 microns, and the weight ratio of agglomerates to single domain particles is from 1:09 to 1:20.

4,321,223
PROCESS FOR PLACING CONCRETE THROUGH HIGH HEAD

Yasushi Nakahara, 546-19, Higashi Asakawa-cho, Hachioji-shi, Tokyo, Japan

Filed Oct. 31, 1979, Ser. No. 89,862
Int. Cl.³ E04B 1/16
U.S. Cl. 264—32 1 Claim



1. A process for placing concrete through a high head, comprising the steps of:
extending a flexible collapsible hose downward from a feeding level at the top of said high head to a discharge level near the bottom of said high head;
introducing a slug of liquid material into the top end of said hose at said feeding level;
airtightly closing the top end of said hose immediately after introduction of said slug therein to prevent air from entering into said hose as said slug of liquid material passes downward to said discharge level for flattening said hose;
thereafter intermittently feeding discrete portions of wet concrete material down through said hose at intervals;
and airtightly closing the top end of said hose immediately after feeding each discrete portion of the concrete material so that said hose remains flattened between adjacent portions of the concrete material, thereby controlling the rate of descent of the concrete portions and maintaining the coherency of each portion.

4,321,224
METHOD FOR PRODUCTION OF SPHERICAL MOLDED PRODUCT CONTAINING TITANIUM OXIDE

Shinkichi Shimizu; Tadao Nishizaki, both of Niihama, and Masabumi Tsuda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 31, 1979, Ser. No. 108,712
Int. Cl.³ D04H 3/16
U.S. Cl. 264—115 12 Claims

1. A method for the production of a spherically molded product of a titanium oxide composition comprising:
(A) charging a rotatable centrifugal fluidizing coating granulator with seeds of an inorganic substance,
(B) during rotation of said granulator, introducing into said granulator a first stream comprising a titanium oxide com-

position powder and simultaneously introducing into said granulator a second stream comprising a mist of an aqueous medium of finely divided aqueous droplets, wherein the weight ratio of said powder to said aqueous medium introduced into said granulator is from 1:0.20 to 1:0.35 and whereby said seeds are coated and enlarged in size to form a spherical product, and

(C) calcining said spherical product at a temperature of from about 300° to about 800° Centigrade for a period of from 1 to 10 hours.

4,321,225

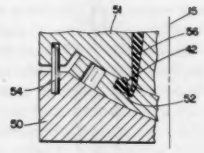
METHOD FOR MAKING A HATCH COVER WITH A SEAL

Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 49,260, Jun. 18, 1979, Pat. No. 4,254,960. This application May 19, 1980, Ser. No. 150,764

Int. Cl.³ B29C *17/10, 17/00;* **B29F** *1/00*

U.S. Cl. 264—138 **3 Claims**



1. The method of making a sealing device comprising providing a rigid member having an upper surface which in a first plane of cross section through said surface is curved and which in a second plane of cross section through said surface normal to said first plane is straight, said member having a transverse axis, forming a circumferentially continuous groove in said upper surface wherein said groove comprises a first pair of spaced apart groove sections extending generally parallel to said first plane and a second pair of spaced apart groove sections extending generally parallel to the second plane and joining with said first groove sections, and thereafter placing the member between a pair of mold members, moving at least one of said mold members to a position wherein a continuous portion of said one mold member projects into said groove and molding a packing member of resilient material into said groove so that the packing member has a portion projecting from said groove upwardly of said upper surface and has a recess below said upper surface and wherein said packing member has a surface extending from said recess to said projection and wherein said packing surface in any plane transverse of the packing being in a line such that no point on said line that is upwardly of another point on said line is radially inward of said another point and separating said mold members from each other after the molding operation is complete by moving said one mold member relative to the other mold member in the direction of said axis.

4,321,226

METHOD AND APPARATUS FOR MAKING TUBULAR PRODUCTS SUCH AS CATHETERS

Jorgen Markling, Ballerup, Denmark, assignor to A/S Surgimed, Olstykke, Denmark

Filed Feb. 15, 1980, Ser. No. 121,682

Claims priority, application Denmark, Feb. 19, 1979, 717/79

Int. Cl.³ B29C *17/08;* **B29D** *3/02, 23/04, 23/05*

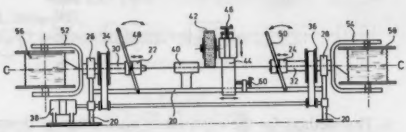
U.S. Cl. 264—139 **6 Claims**

1. A method of preparing a tubular product, in particular for making catheters, said tubular product including an inner plastic layer, an outer plastic layer, and a wire sheathing embedded there-between, the method comprising the steps of:

applying said inner plastic layer onto a core wire as a plastic coating thereon,

applying said wire sheathing onto said plastic coating as a continuous structure thereon,

locally removing said wire sheating at spaced locations, thereby providing defined spaced curcumferential areas without said wire sheating and intermediate areas including said wire sheathing,



applying said outer plastic layer over said spaced and intermediate areas, forming a structure intermittently reinforced with wire sheathing covered by said outer plastic layer,

cutting said structure at one end of each of said defined spaced areas without said wire sheathing, and

removing said core wire from said strand pieces to provide said tubular product.

4,321,227

INJECTION MOULDING PROCESS AND APPARATUS

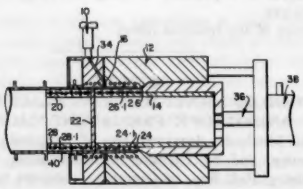
Basil Henfrey, Kloof, and Kenneth R. Hart, Durban, both of South Africa, assignors to AECI Limited, Johannesburg, South Africa

Filed Mar. 5, 1980, Ser. No. 127,304

Claims priority, application South Africa, Apr. 12, 1979, 79/1782

Int. Cl.³ B29F *23/02*

U.S. Cl. 264—167 **4 Claims**



1. A process for injection moulding hollow plastics articles, which comprises the steps of (i) providing a non-split mould having first and second opposite ends and being immovable laterally of the axial ends thereof, a movable inner mandrel extending from the first end into the mould and defining between its outer surface and the inner surface of the mould the shape of the article to be moulded, inlet means for injecting heated plastics material into the space between the mould and the inner mandrel, said second end being an open end for removal of the article and being provided with gates capable of lateral movement relative to the outer surface of the mould for closing said second end, an exterior mandrel of not larger cross-sectional size than the inner mandrel, said exterior mandrel being aligned with the inner mandrel and at least partially positioned exteriorly of the gates during moulding, and ram means operatively connected to the inner mandrel for moving the inner mandrel axially away from and towards the gates, (ii) injecting molten plastics material through the inlet means into the space between the mould and the inner mandrel, (iii) operating the ram means to cause the newly moulded unit of hollow plastics article to be slid at least partially onto the exterior mandrel, with the rear end of the newly moulded unit of the article remaining in the mould adjacent to the said second end for a further unit to be welded thereto on effecting injection moulding, and with the front end of the newly moulded article

being positioned on the exterior mandrel outside the gates for cooling thereof on the exterior mandrel to take place, (iv) allowing the formed unit of the hollow plastics article to cool outside the mould, and (v) repeating steps (ii), (iii) and (iv) until the desired length of hollow plastics article has been formed.

4,321,228

METHOD OF AND APPARATUS FOR MANUFACTURING A PLASTIC PIPE COMPRISING LONGITUDINALLY EXTENDING HOLLOW CHANNELS IN ITS WALL

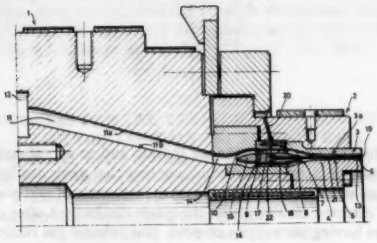
Johan de Kok, Hardenberg, Netherlands, assignor to Wavin B.V., Em Zwolle, Netherlands

Filed Mar. 25, 1980, Ser. No. 133,849

Claims priority, application Netherlands, Mar. 27, 1979, 7902394

Int. Cl.³ B29D *23/04*

U.S. Cl. 264—209.8 **8 Claims**



1. Method of manufacturing a plastic pipe, the wall of which comprises longitudinally extending hollow channels, by extruding a thermoplastic through an annular extrusion region, provided with a plurality of circumferentially equidistantly divided channel-forming pins, said pins being retained in an annular body disposed in a cylindrical channel, said pins forming longitudinal closed zones which form the hollow channels, whereby, prior to approaching said longitudinal closed zones, the stream of thermoplastic is subdivided into two concentric annular streams, the stream of thermoplastic being subdivided at at least one location into ring segment partial streams, only one of the concentric annular streams being subdivided into annular segment partial streams.

4. Apparatus for manufacturing a plastic tube the wall of which comprises longitudinally extending hollow channels, comprising an extruder provided with an extrusion nozzle, a plurality of circumferentially equidistantly divided channel forming pins, said pins being retained in an annular body disposed in a cylindrical channel, thereby dividing said channel into two concentric annular division channels, and at least one breaker, wherein at least one of the concentric annular division channels forms a free passage between the inlet and the outlet of the aforementioned annular division channel.

4,321,229

METHOD FOR EXTRUDING LINEAR POLYOLEFIN MATERIALS HAVING HIGH VISCOSITIES

Theodore R. Blakeslee, III, Hillsborough; Stuart J. Kurtz, Martinsville; Leonard S. Scarola, Union; John C. Miller, Piscataway, all of N.J.; James D. Engle, Darien, and Jerome T. Horner, Indian Head Park, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 22, 1980, Ser. No. 199,651

Int. Cl.³ B29B *1/06*

U.S. Cl. 264—349 **8 Claims**

1. In the extrusion of low-density, linear polyolefin materials having high viscosities, wherein such materials are continuously fed to and through a rotary extruder including an extruder housing defining a cylindrical interior and containing an extruder screw having helical screw flights having feeding, transition and metering sections, the improvement which comprises employing, in said extruder screw in cooperation with the cylindrical interior of said extruder housing, opened lead-

ing edges for said screw flights of said sections; and surfaces of the screw flights of said sections coated with gall-resistant material.

4,321,230

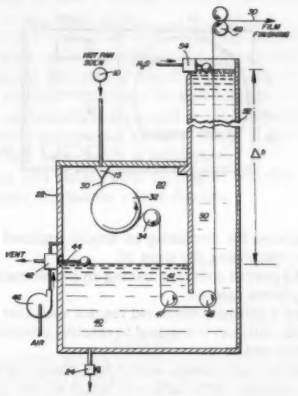
PROCESS FOR RECOVERING FILM FROM PRESSURIZED EXTRUSION ZONE

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,708

Int. Cl.³ B29C *17/04*

U.S. Cl. 264—556 **10 Claims**



1. A process for making a polyacrylonitrile continuous extrusion which comprises the steps of:

providing high-nitrile polymer in aqueous medium at elevated temperature and pressure;

extruding said polymer and aqueous medium as an essentially homogeneous solution into a pressurized chamber of gas;

maintaining sufficient gas pressure in said chamber to prevent flashing of water;

cooling said solution to form a hydrogel extrusion essentially free of disruptions;

passing said extrusion downwardly into a liquid leg below said chamber and upwardly through a liquid standing column having an upper exit end substantially elevated above said chamber and open to ambient pressure, said liquid column being in communication with said chamber through said liquid leg, thereby exerting pressure in said chamber; and

recovering said extrusion from said liquid column under ambient conditions.

4,321,231

PROCESS FOR DECREASING THE RATE OF TITANIUM CORROSION

Vijai P. Gupta, Crosby, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 11, 1979, Ser. No. 29,238
Int. Cl.³ C23F 11/04
U.S. Cl. 422—12 8 Claims

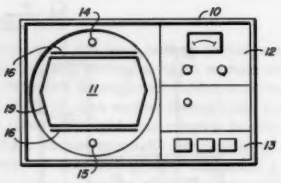
1. A process for decreasing the rate of corrosion of titanium and titanium alloys in the presence of a corrosive aqueous medium containing acidic moieties in contact therewith at elevated temperature in the substantial absence of molecular oxygen which comprises providing in the corrosive aqueous media a corrosion inhibitor selected from the group consisting of a compound of tellurium, selenium and mixtures thereof, said compound being capable of providing cations of these elements in any of their positive valence states when contacted with the said corrosive aqueous media, in an amount sufficient to provide at least about 1×10^{-6} gram-atoms of dissolved tellurium or selenium values per gram-mole of acidic moieties in the corrosive aqueous medium.

4,321,232

PACKAGE AND STERILIZING PROCESS FOR SAME

Roger M. Bithell, Richmond, Calif., assignor to Tegal Corporation, Novato, Calif.

Filed Mar. 25, 1980, Ser. No. 134,015
Int. Cl.³ A61L 2/14
U.S. Cl. 422—23 4 Claims



1. A process for sterilizing an article enclosed in a porous container comprising the steps of:

placing a porous container having an article enclosed therein in a plasma reactor;

inducing a plasma within said reactor such that the exterior of said container is exposed to reactive components of said plasma; and

maintaining said plasma within said reactor and outside of said container for a sufficient length of time for said reactive components to act through said porous container to an extent such that the probability of a microbiological contaminant surviving on said article located therein is very low.

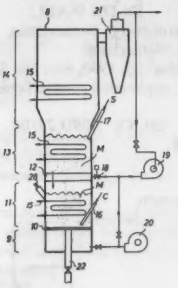
4,321,233

COMBUSTION FURNACE OR REACTOR WITH MULTI-STAGE FLUIDIZED BED SYSTEM

Shoichi Tsuji, Hoya; Kiyoshi Aoki, Chiba, and Minoru Asai, Kamagaya, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,279
Claims priority, application Japan, Nov. 11, 1978, 53/139185
Int. Cl.³ B01J 8/28
U.S. Cl. 422—142 1 Claim

1. In a chemical reactor having a multi-stage fluidized bed arrangement and provided with at least an upper and a lower fluidized bed system, said systems forming zones in which fluidized beds and bed particles containing particles of limestone are formed, wherein the lower fluidized bed is provided with a fuel feeding means and a combustion air supply means, the improvement comprising: a plate-shaped partition device located between said upper and lower fluidized bed systems, said partition device being formed with a plurality of exhaust gas distribution holes therein for distributing the exhaust gases from said lower fluidized bed into said upper fluidized bed, and wherein the upper end of said zone forming said lower fluidized bed and the lower end of said zone forming said upper fluidized bed are communicated through said partition device, said partition device having formed thereon a plurality of nozzles connected to said combustion air supply means for



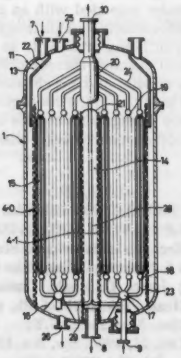
introduction of combustion air thereto and to an exhaust gas recirculation means for introducing recycled gases discharged after combustion into said reactor, at least some of said nozzles being directed downwardly, the gases discharged after combustion having no oxygen content, said exhaust gas recirculation means being part of an exhaust gas recirculation system by means of which part of the exhaust gases discharged from said reactor is introducible into said upper fluidized bed through said nozzles of said partition device.

4,321,234

CHEMICAL PROCESS AND APPARATUS THEREFOR

Kozo Ohsaki, Funabashi; Jun Zamma; Yukihiro Kobayasi, both of Chiba, and Hiroshi Watanabe, Kanagawa, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Division of Ser. No. 133,798, Mar. 25, 1980. This application Dec. 22, 1980, Ser. No. 219,359
Claims priority, application Japan, Apr. 3, 1979, 54/39306
Int. Cl.³ F28D 7/00; B01J 8/02
U.S. Cl. 422—200 11 Claims



1. A reaction vessel for exothermic catalytic gas-phase reaction, said reaction vessel comprising a vertical, cylindrical shell; an inlet for gaseous raw materials and an outlet for reaction effluent gas; an inlet and an outlet for a cooling medium; a cylindrical, peripheral catalyst receiver open at both ends

and having a plurality of holes through the wall thereof, said peripheral catalyst receiver being disposed vertically inside said shell; a cylindrical, central catalyst receiver having a plurality of holes through the wall thereof and being disposed vertically inside said peripheral catalyst receiver; a solid catalyst layer comprising a catalyst packed in the space between said peripheral and said central catalyst receiver; a plurality of vertically extending cooling tubes connected at one end thereof to said inlet for the cooling medium and at the other end thereof, to said outlet for the cooling medium said plurality of cooling tubes being disposed in said catalyst layer; a first, peripheral pressure-uniformalizing space between said sheel and said peripheral catalyst receiver; and a second, central pressure-uniformalizing space inside said central catalyst receiver which second space is separated from said first space by a partition plate disposed at one end of said central catalyst receiver; said inlet for the gaseous raw materials being connected to one of said spaces whereby the flow of said gaseous raw materials is substantially in the radial direction while removing the heat of reaction that has been generated, to thereby attain an optimum temperature distribution along the radial direction, and is then discharged through said outlet for the reaction effluent gas connected to said other space.

4,321,235
PROCESS FOR THE TREATMENT OF ALKALINE LIQUORS CONTAINING SULFATE IONS

Pierre Mouret, Bourg la Reine; Georges Lyaudet, Chilly Mazarin; Angelo Sialino, Ris Orangis, and Rino Berri, Chatillon, all of France, assignors to Compagnie Generale des Matieres Nucleaires (COGEMA), Paris, France

Filed Feb. 8, 1978, Ser. No. 876,158

Claims priority, application France, Feb. 9, 1977, 77 03640

The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.³ C01G *43/00;* C01F *11/46;* C01D *7/00*

U.S. Cl. 423—7 **14 Claims**

1. Process for removing sulfate ions in solid form and separately recovering sodium ions from an alkaline solution containing both sulfate ions and sodium ions which comprises:

(a) contacting said alkaline solution with a cation exchange resin initially in the ammonium form to effect ion exchange between the sodium ions of said alkaline solution and the ammonium ions of said cation exchange resin, and recovering, after the ion exchange has been effected, a solution containing sulfate ions and ammonium ions, said sodium ions being retained on said cation exchange resin;

(b) treating said solution containing sulfate ions and ammonium ions with calcium in a soluble form to precipitate the sulfate ions as insoluble calcium sulfate; and,

(c) eluting the sodium ions retained on the cation exchange resin, with a solution of an ammonium salt, other than a sulfate, whereby the cation exchange resin is regenerated and the sodium ions are recovered in the form of a sodium salt, other than a sulfate.

13. In a process for extracting uranium from uraniferous ore containing sulfides or sulfates, or both, by leaching said ores with an alkaline leaching solution containing sodium carbonates or bicarbonates, or both, in the presence of an oxidant to form a leaching solution containing extracted uranium, the improvement which comprises contacting the leaching solution containing extracted uranium with a cation exchange resin in the ammonium form to effect ion exchange between the sodium ions in said alkaline leaching solution and the ammonium ions of said cation exchange resin and recovering after the ion exchange has been effected a solution containing sulfate ions and ammonium ions, said sodium ions being retained on said ion exchange resin; selectively separating uranium from the solution containing sulfate ions and ammonium ions; and thereafter, treating said solution containing sulfate ions and ammonium ions with calcium hydroxide to precipitate the sulfate ions as insoluble calcium sulfate and, thereafter, eluting the sodium ions retained on the ion exchange resin with a solution of an ammonium salt, other than a sulfate, whereby the cation exchange resin is regenerated and the sodium ions are recovered in the form of a sodium salt, other than a sulfate.

4,321,236
PROCESS FOR BENEFICIATING TITANIFEROUS MATERIALS

Edgel P. Stambaugh, Worthington, and David W. Neuendorf, Lancaster, both of Ohio, assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Feb. 5, 1981, Ser. No. 232,057

Int. Cl.³ C01G *23/02*

U.S. Cl. 423—82 **4 Claims**

1. A titaniferous material beneficiation process comprising:

heating an aqueous hydrochloric acid to a temperature above about 95° C.;

heating a particulate titaniferous material containing acid-soluble contaminant values including iron to a temperature above about 100° C.;

contacting said heated particulate with said heated acid to dissolve at least a portion of said contaminant values to provide a leach liquor containing acid-soluble contaminant values and a beneficiated particulate comprising titanium values which are substantially insoluble in said heated acid;

hydrolyzing at least a portion of any dissolved titanium values in said leach liquor;

precipitating a substantial portion of said hydrolyzed titanium values upon the surface of at least a portion of said beneficiated particulate whereby diffusion of said dissolved titanium values into the bulk solution of said leach liquor substantially is prevented and the formation of fines comprising precipitated titanium values in the bulk solution of said leach liquor is reduced; and

recovering said beneficiated particulate together with any precipitate of titanium values thereon.

4,321,237
TREATING HYDROLYSIS RESIDUES FROM PREPARATION OF TITANIUM DIOXIDE

Peter Panek; Peter Woditsch, both of Krefeld, and Werner Kanschen, Duisburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,707

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951749

Int. Cl.³ C01G *23/00*

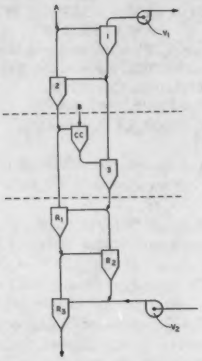
U.S. Cl. 423—82 **6 Claims**

1. In the process wherein a titanium-containing material is subjected to reaction with sulphuric acid to form a solid reaction mass from which the titanium values are recovered in solution by hydrolysis with water or dilute sulphuric acid leaving behind a hydrolysis residue and the hydrolysis residue is thereafter treated to recover at least part of the titanium contained therein, the improvement wherein the treatment of the hydrolysis residue is effected by contacting by weight about 5 to 95% of the hydrolysis residue and the balance to 100% thereof of a slag having a TiO_2 content >60% by weight and a Ti(III) content of about 5 to 40% by weight with sulphuric acid of a concentration greater than 86%, and thereafter optionally adding water, steam or dilute sulphuric acid to start the reaction.

4,321,238
PROCESS FOR HIGH TEMPERATURE PHOSPHATE ORE BURNING

Jean-Pierre Henin, La Madeleine, France, assignor to Fives-Cail Babcock, Paris, France

Filed Apr. 16, 1979, Ser. No. 29,991
Claims priority, application France, Apr. 20, 1978, 78 11673
Int. Cl.³ C01F 11/46
U.S. Cl. 423—167 **10 Claims**



1. A high temperature phosphate ore burning process, comprising the steps of

(a) preheating the ore while suspended in gases discharged from a stationary combustion zone,

(b) supplying a stream of air to the combustion zone,

(c) injecting and dispersing the preheated ore and a fuel into the stream of air whereby the air causes the fuel to be combusted to produce heat for burning the ore,

(d) permitting the ore while suspended in the stream of air to dwell in the combustion zone in suspension for less than 30 seconds,

(e) discharging the burned ore and gases produced by the combustion of the fuel from the combustion zone through a common outlet,

(f) separating the burned ore from the gases, and

(g) cooling the separated burned ore by means of cold air,

(1) the stream of air supplied to the combustion zone being at least partially constituted by the cooling air.

4,321,239
METHOD OF THERMAL TREATMENT OF A CARBONATE SUSPENSION

Viktor L. Bildjukevich, ulitsa Surganova, 8, kv. 37; Boris K. Demidovich, 2 pereulok Rozy Ljuxemburg, 3-a, kv. 120; Dmitry T. Yakimovich, ulitsa Knorina, 10b, kv. 33; Leonid N. Turovsky, ulitsa Brestskaya, 86, kv. 36; Gennady Z. Plavnik, ulitsa Ya.Kolasa, 74, kv. 2; Valentina A. Lebedkova, ulitsa Odoevskogo, 36/7, kv. 92, all of Minsk; Anatoly P. Kupriyanenko, ulitsa Uritskogo, 31, kv. 47, Slutsk; Sofya L. Kozlova, ulitsa Avakiana, 36, korpus 2, kv. 55, and Alexandr I. Pivovarov, ulitsa Gaya, 38, kv. 5, both of Minsk, all of U.S.S.R.

Filed Sep. 4, 1980, Ser. No. 184,014
Int. Cl.³ C01F 11/06
U.S. Cl. 423—175 **3 Claims**

1. A method of thermal treatment of a carbonate suspension yielding lime and carbon dioxide-containing gas, such as a filtration sediment of sugar production, comprising the sequential steps of:

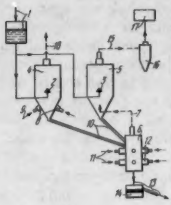
(a) dividing said suspension into a first portion and a second portion;

(b) spray-drying said first and second portions of said suspension accomplished simultaneously and independently for each of said portions and passing the dried material directly to step (c);

(c) calcining by a heat-carrier the dried material produced in step (b) from said first and second portions of said suspension to yield lime and carbon dioxide;

(d) cooling the lime produced after said calcining;

(e) supplying the gas from the zone of said calcining to the region in which spraydrying of said first portion of said suspension occurs;



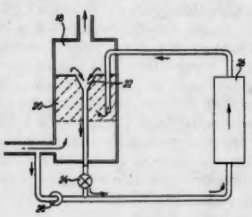
(f) withdrawing and recovering carbon dioxide from the spent gas after step (b) spray-drying of said first portion of said suspension;

effecting said calcining by means of the heat provided by said heat-carrier required for calcining said dried material and said spray-drying only said first portion of said suspension.

4,321,240
TREATMENT OF GASEOUS EFFLUENT

Eric Robinson, Lisburn, Northern Ireland, assignor to Carus Chemical Company, LaSalle, Ill.

Continuation-in-part of Ser. No. 785,549, Apr. 7, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,022
Claims priority, application United Kingdom, Sep. 8, 1976, 37111/76
Int. Cl.³ B01D 53/36
U.S. Cl. 423—210 **4 Claims**



1. A process for treating a gaseous effluent containing a pollutant susceptible to catalytic oxidation with particles of a metal oxide capable of adsorbing said pollutant at an adsorbing temperature substantially below 100° C. and of oxidizing said pollutant at an oxidizing temperature substantially higher than said adsorbing temperature, comprising the steps of fluidizing a bed of said metal oxide particles with an upward flow of said pollutant-containing gaseous effluent at an adsorbing temperature substantially below 100° C. to cause adsorption of pollutant on said particles as they circulate within said bed and to remove pollutant from said effluent, continuously diverting a fractional portion of the particles with pollutant adsorbed thereon from said fluidized bed and conveying the same by a gaseous carrier stream from said bed and through a catalytic oxidation zone maintained at an oxidizing temperature substantially higher than said adsorbing temperature to strip pollutant from said particles and to oxidize the pollutant so removed,

and thereafter cooling the diverted particles and carrier stream and directing the same back into said fluidized bed.

4,321,241

PROCESS FOR THE PURGING OF FLUE GASES CONTAINING ACIDIC COMPONENTS

Horst Bechthold, Erftstadt-Friesheim, Fed. Rep. of Germany, assignor to FA. Maschinenfabrik Buckau R. Wolf AG, Grevenbroich, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,293

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904263

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 6 Claims

1. A process for the desulfurization of a flue gas by means of an ammonia-containing aqueous washing solution, said flue gas containing sulfur dioxide, carbon dioxide and other acidic components, said process comprising adding ammonia to the washing solution in the stoichiometrically necessary amount for reaction with the sulfur oxides; and maintaining 2–60% by weight of ammonium carbonate in the washing solution by feeding back into said flue gas when said flue gas enters the washing process the ammonia, water vapor and carbon dioxide gaseous decomposition products of ammonium carbonate formed during the washing process so as to cause reformation of ammonium carbonate in the washing solution.

4,321,242

LOW SULFUR CONTENT HOT REDUCING GAS PRODUCTION USING CALCIUM OXIDE DESULFURIZATION WITH WATER RECYCLE

Jerome Feinman, Grand Junction, Colo., and Joseph E. McGreal, Jr., Penn Hills Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1980, Ser. No. 192,404

Int. Cl.³ C01B *17/00;* B01J *8/00;* C01F *1/00;* C01B *17/16*

U.S. Cl. 423—244 28 Claims

1. A process for producing a low-sulfur content hot reducing gas stream comprising (a) contacting a sulfur bearing hot reducing gas stream with a desulfurizing agent comprising a bed of solid particles comprising calcium oxide to thereby produce a low-sulfur content hot reducing gas stream and a calcium sulfide composition, then (b) contacting said calcium sulfide composition with hot liquid water at a temperature and corresponding pressure sufficient to maintain steam in the system to thereby convert the sulfide of said composition to calcium hydroxide and hydrogen sulfide and to produce a sulfur containing water, and then (c) repeatedly recycling for reuse in step (b) at least a major portion of the sulfur containing water produced in step (b) in combination with fresh water which is repeatedly added in amounts sufficient to achieve effective sulfur removal from said calcium sulfide composition and wherein said fresh water added in step (c) is first used to wash the calcium hydroxide produced in step (b) prior to combining said fresh water with said sulfur containing water.

4,321,243

METHOD OF PRODUCING STABILIZED AQUEOUS DISPERSIONS OF SILICA FUME

Charles E. Cornwell, 7104 Marian Dr., Alexandria, Va. 22307, and Mark Plunguian, 1515 S. Jeff. Davis Hwy., Arlington, Va. 22202

Filed Aug. 5, 1980, Ser. No. 175,668

Int. Cl.³ C01B *33/141*

U.S. Cl. 423—268 2 Claims

1. The method of stabilizing an aqueous dispersion of silica fume at a starting pH of about 6.7, in order to retain its flowability and redispersibility, the fume being the oxidized particulates of the gaseous by-products obtained during the manufacture of silicon and its alloys by feeding a charge of quartz, being composed of silicon dioxide, coal, wood chips, and as an alternate additive also scrap iron to produce ferrosilicon alloys, to the top of a tall furnace provided with carbon electrodes to generate the required high temperature, where the silicon dioxide of the quartz is reduced by the carbon of the coal to silicon and the silicon monoxide in the gaseous by-products is oxidized to silicon dioxide, comprising the step of adding an acid to the aqueous dispersion of the particulates to reduce the pH to a range of 3–6.

2. The method of stabilizing an aqueous dispersion of silica fume at a starting pH of about 6.7, in order to retain its flowability and redispersibility, the fume being the oxidized particulates of the gaseous by-products obtained during the manufacture of silicon and its alloys by feeding a charge of quartz, being composed of silicon dioxide, coal, wood chips, and as an alternate additive also scrap iron to produce ferrosilicon alloys, to the top of a tall furnace provided with carbon electrodes to generate the required high temperature, where the silicon dioxide of the quartz is reduced by the carbon of the coal to silicon and the silicon monoxide in the gaseous by-products is oxidized to silicon dioxide, comprising the step of adding a chelating agent to the aqueous dispersion selected from the group of ethylene diamine tetraacetic acid and its water-soluble salts.

4,321,244

PROCESS FOR THE TREATMENT OF A CALCIUM ALUMINOPHOSPHATE

Claude Magnier, Paris, and Jean Grosbois, L'Isle Adam, both of France, assignors to Groupement Franco-Senagalais d'Etudes et de Recherches Industrielles, Courbevoie, France

Filed Aug. 5, 1980, Ser. No. 175,583

Claims priority, application France, Sep. 7, 1979, 79 22393

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—320 19 Claims

1. A process for the treatment of phosphatic rock, essentially constituted by calcium aluminophosphates and containing iron and other cations in small concentrations, which process comprises:

(a) subjecting the ground rock to calcination treatment in the presence of concentrated sulfuric acid in stoichiometric excess with respect to the aluminum, calcium and iron contained in the starting rock for a time between about a few minutes and about five hours and at a temperature above about 120° C. to obtain a paste which contains aluminum sulfate and iron sulfate in substantially anhydrous form, phosphoric acid and sulfuric acid;

(b) subjecting the paste obtained in step (a) above to controlled take-up by means of water or an aqueous solution comprising phosphoric or sulfuric acid or both to obtain two phases, the first phase being a solid residue substantially containing aluminum, calcium and iron from the starting rock and the second phase comprising aqueous phosphoric and sulfuric acid solution;

(c) separating the second phase obtained in step (b) from the first phase obtained in step (b) to obtain an aqueous solution comprising a mixture of sulfuric and phosphoric acid.

4,321,245

PROCESS FOR THE PURIFICATION OF WET-PROCESSED PHOSPHORIC ACID

Reinhard Gradl, Hürth; Klaus Schrödter, Cologne, and Klaus-Peter Ehlers, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,172

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945874

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 S 3 Claims

1. In the process for the purification of aqueous wet-processed phosphoric acid in the presence of sulfuric acid by passing counter-currently the said phosphoric acid and organic solvents which are immiscible or only partially miscible with water through a multi-stage extraction installation; adding barium compounds, which form sparingly soluble precipitates

with sulfate ions to remove these ions; separating an organic solvent phase and an aqueous phase being formed and recovering from the separated organic solvent phase the purified phosphoric acid: the improvement which comprises

(a) carrying out the said purification process in an n-stage extraction installation wherein n is an integer greater than 4;

(b) feeding the phosphoric acid to be purified into the first extraction stage;

(c) feeding the organic solvent into the last extraction stage n and the sulfuric acid counter-currently to the phosphoric acid into one of the stages having an integer less than n;

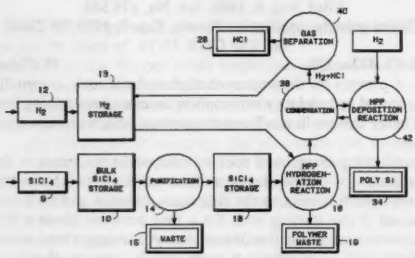
(d) adding the barium compound premixed or simultaneously with the phosphoric acid to the first extraction stage and

(e) dispersing within the extraction stages the organic solvent phase in the aqueous phase.

4,321,246
POLYCRYSTALLINE SILICON PRODUCTION

Kalluri R. Sarma; M. John Rice, Jr., both of Tempe; I. Arnold Lesk, Phoenix, and Roger G. Nikirk, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,093
Int. Cl.³ C01B *33/02, 33/107*
U.S. Cl. 423—350 **8 Claims**



1. A process for producing polycrystalline silicon which comprises the steps of: in a first high pressure plasma reactor reacting hydrogen with silicon tetrachloride in a high pressure plasma hydrogenation reaction at a pressure of about one atmosphere, the effluent from said reaction including silicon bearing compounds including silicon tetrachloride, trichlorosilane, and dichlorosilane; separating said silicon bearing compounds from said effluent; and in a second high pressure plasma reactor reducing said silicon bearing compounds with hydrogen on a heated substrate in a high pressure plasma reaction at a pressure of about one atmosphere to deposit silicon on said heated substrate.

4,321,247
PROCESS FOR PREPARING SODIUM BICARBONATE AND HYDROGEN CHLORIDE

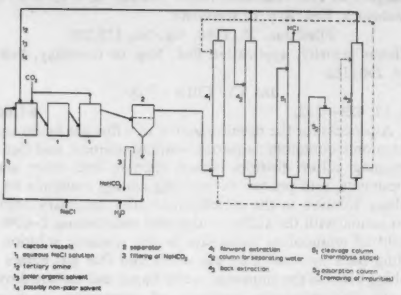
Alfred Coenen, Maria Laach; Kurt Kosswig, Marl; Ferdinand v. Praun, Haltern, and Hans Regner, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,592
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940614; Aug. 19, 1980, 3031252
Int. Cl.³ C01D *7/00*; C01B *7/07*
U.S. Cl. 423—424 **15 Claims**

1. In a method for producing sodium bicarbonate and hydrogen chloride by reacting an aqueous sodium chloride solution with carbon dioxide in the presence of an amine and an organic solvent, the improvement comprising:

(a) introducing said carbon dioxide into a mixture comprising
(A) said aqueous sodium chloride solution,
(B) said amine comprising a tertiary amine, and
(C) said organic solvent comprising at least one polar, organic solvent to produce an aqueous phase and at least one organic phase;

(b) separating said aqueous phase and said organic phase;



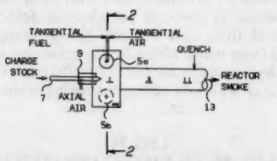
(c) separating said sodium bicarbonate from said aqueous phase, reconcentrating said separated aqueous phase with sodium chloride and feeding back said reconcentrated aqueous phase into step (a); and

(d) separating said hydrogen chloride from said organic phase by heating.

4,321,248
METHOD FOR VORTEX FLOW CARBON BLACK PRODUCTION

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1980, Ser. No. 145,094
Int. Cl.³ C01B *31/02*; C09C *1/48*
U.S. Cl. 423—456 **5 Claims**



1. A method for producing carbon black comprising:

(a) introducing combustion gas in a precombustion or combustion zone of a carbon black reactor in a manner to produce a vortex of combustion gases traveling axially in said reactor,

(b) introducing internally to said combustion gas vortex (1) an axial flow of feedstock and surrounding this feedstock (2) a vortex of air to produce a flow of fluid which contains feedstock and air in a vortex moving axially in said reactor in the same direction as the vortex of combustion gases produced in (a), and

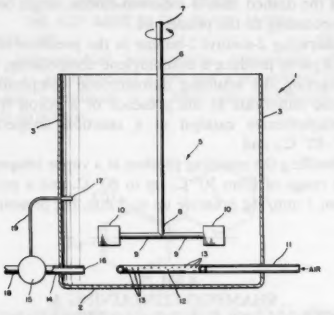
(c) passing said vortices through a combustion zone under conditions to produce carbon black.

4,321,249

PROCESS FOR THE PRODUCTION OF ARTIFICIAL IRON OXIDE

Panayotis Gavogiannis, Athens, Greece, assignor to Chrostical Sidirou Co., Ltd., Athens, Greece

Filed Nov. 28, 1980, Ser. No. 211,385
Claims priority, application Greece, Nov. 29, 1979, 60638
Int. Cl.[3] C01G *49/02;* C01F *11/46, 5/40*
U.S. Cl. 423—632 5 Claims



1. A process for producing yellow iron oxide pigment which comprises providing an aqueous solution of a water soluble ferrous salt, adding to said aqueous solution a metal carbonate which is insoluble at a pH greater than 4 in an amount equal to the stoichiometrically equivalent of the ferrous salt such that a complete reaction of the respective constituents is realized, said metal carbonate being added to said ferrous salt aqueous solution in the presence of oxygen, wherein the ensuing oxidation reaction takes place in a suspension wherein the pH thereof is maintained at a value of 4 or less, but always such that an acidic condition prevails, such that the entire amount of iron present in said ferrous salt is precipitated as yellow iron oxide pigment in the form of FeOOH.

4,321,250

RHODIUM-CONTAINING PEROVSKITE-TYPE CATALYSTS

Peter J. Hart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 96,718, Nov. 21, 1979. This application Aug. 12, 1980, Ser. No. 177,316
Int. Cl.[3] C01B *1/18*
U.S. Cl. 423—652 4 Claims

1. A method for producing hydrogen comprising contacting steam and a hydrocarbon feedstock at steam reforming conditions including a temperature of between about 600° to 1000° C. and a pressure of between about 10^4 to 5.2×10^6 Pa in the presence of sulfur-containing contaminant with a catalyst that is a compound having the perovskite-type ABO_3 crystal structure wherein

from about 1 to up to 20% of the B cation sites are occupied by rhodium ions and the remainder of the B cation sites are occupied by ions consisting essentially of cobalt ions, and

the A cation sites are occupied by lanthanide ions of atomic number 57 to 71 and ions of at least one metal of Groups IA, IIA and IVA of the Periodic Table having ionic radii of about 0.9A to 1.65, and proportioned so that at least 50% of the cobalt ions are trivalent.

4,321,251

DETECTION OF MALIGNANT LESIONS OF THE ORAL CAVITY UTILIZING TOLUIDINE BLUE RINSE

Arthur Mashberg, East Orange, N.J., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 19, 1979, Ser. No. 105,079
Int. Cl.[3] A61K *6/00;* G01N *1/30, 33/48*
U.S. Cl. 424—3 1 Claim

1. A method of detecting malignant lesions of the oral cavity by utilizing toluidine blue as a rinse wherein said rinse is an aqueous acetic acid solution containing a 1% toluidine blue solution comprising acetic acid, alcohol and water, and wherein the toluidine blue rinse is used on Day 1 of a clinical regimen and if an area of stain is detected, an application of toluidine blue is performed on the detected area on a day selected from Day 10–14, said regimen employing toluidine blue rinse comprising

(a) rinsing the mouth of the patient with 1% acetic acid for a period of about 20 seconds followed by a similar rinse with water twice for about 20 seconds;

(b) rinsing the mouth of the same patient with 5–10 cc. 1% toluidine blue solution while simultaneously gargling; and

(c) rinsing with 1% acetic acid solution (5 oz.) for about 1 minute followed by a water rinse.

4,321,252

POLYMERIC DIFFUSION MATRIX CONTAINING ESTER DERIVATIVES OF ESTRADIOL

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 167,729, Jul. 11, 1980, which is a continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned. This application Dec. 17, 1980, Ser. No. 217,400
Claims priority, application Japan, Aug. 14, 1979, 54-103459
Int. Cl.[3] A61F *13/00;* A61K *9/70;* A61L *15/03;* A61K *31/79*
U.S. Cl. 424—28 17 Claims

1. A self-supporting polymeric diffusion matrix for the sustained release of a pharmacologically acceptable estradiol in order to deliver said estradiol ester to a patient and provide said patient with a uterine wall maintenance effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to about 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of the estradiol ester to provide a sustained release of said estradiol ester over a prolonged period.

4,321,253

SUSPENSION OF MICROENCAPSULATED BACAMPICILLIN ACID ADDITION SALT FOR ORAL, ESPECIALLY PEDIATRIC, ADMINISTRATION

Morgan L. Beatty, Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017

Filed Aug. 22, 1980, Ser. No. 180,537
Int. Cl.[3] A61K *9/50, 31/43, 9/14*
U.S. Cl. 424—35 12 Claims

1. A powder capable of being reconstituted by addition of water to yield a pharmaceutical suspension of bacampicillin acid addition salt microcapsules in an aqueous suspension medium, said powder comprising a mixture of bacampicillin acid addition salt microcapsules and a plurality of pharmaceutically acceptable suspension vehicle ingredients,

said microcapsules comprising a core of a pharmaceutically acceptable, water-soluble acid addition salt of bacampicillin and a coating thereon consisting essentially of a mixture of a major portion of ethyl cellulose and a minor portion of a pharmaceutically acceptable, water-soluble or water-permeable filler material,

said vehicle ingredients being such that the pH of the aque-

ous suspension medium in said reconstituted pharmaceutical suspension is at least 6.9, and

the weight ratio of ethyl cellulose to said filler material in said coating being such that said pharmaceutical suspension has a stability of at least 85% retention of potency after 14 days at about 3° C., and provides an average maximum blood serum ampicillin level of at least about 6 micrograms/ml. after oral administration thereof to adult humans.

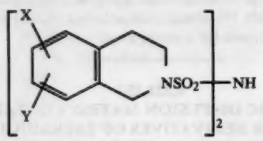
4,321,254

ANTIALLERGIC IMIDODISULFAMIDES

Fadia E. Ali, Cherry Hill, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

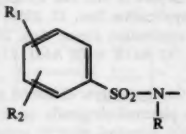
Filed Sep. 26, 1980, Ser. No. 191,644
Int. Cl.³ A61K *31/47;* C07D *401/12*
U.S. Cl. 424—40 15 Claims

1. A compound of the formula (I)



(I)

in which X is hydrogen, methyl, bromo or chloro; and Y is a phenylsulfonamido radical of the formula



in which R is hydrogen or methyl; R_1 is hydrogen, bromo, chloro, nitro, methyl, trifluoromethyl or methoxy; and R_2 is hydrogen, chloro or methyl provided that when R_2 is chloro, R_1 is chloro, methyl or trifluoromethyl and when R_2 is methyl R_1 is methyl; or an alkali metal salt of said compound.

8. A pharmaceutical composition for inhibiting the symptoms of asthma comprising a pharmaceutical carrier or diluent and an amount sufficient to produce said inhibition of a compound of claim 1.

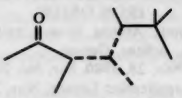
4,321,255

USE OF BRANCHED KETONES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS, CHEWING GUMS, TOOTHPASTES OR CHEWING TOBACCO

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 4, 1980, Ser. No. 184,132
Int. Cl.³ A23L *1/226*
U.S. Cl. 424—49 5 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff, chewing gum or toothpaste comprising the step of adding to a foodstuff, toothpaste or chewing gum from 0.05 parts per million up to about 100 parts per million based on the weight of the total foodstuff, chewing gum or toothpaste composition of a product containing a major proportion of a mixture defined according to the structure:



wherein in each of the molecules of the mixture, one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond, produced according to the process of:

(i) dimerizing 2-methyl-2-butene in the presence of an acid catalyst to produce a diisoamylene composition;

(ii) reacting the resulting diisoamylene composition with acetic anhydride in the presence of a boron trifluoride diethyletherate catalyst at a reaction temperature of 80°–85° C.; and

(iii) distilling the resulting product at a vapor temperature in the range of from 30° C. up to 80° C. and a pressure of from 3 mm/Hg pressure up to 5 mm/Hg pressure.

4,321,256

SHAMPOO CONTAINING A POLYGLYCOL-POLYAMINE CONDENSATION RESIN AND A PHOSPHATE ESTER

Tatsuru Hasegawa, Machida; Yasuo Ohmi; Guy A. G. Ricketts, both of Tokyo, all of Japan, and Stuart J. Sime, Little Sutton, England, assignors to Lever Brothers Company, New York, N.Y.

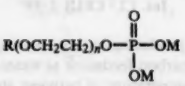
Filed Jul. 14, 1980, Ser. No. 167,977
Claims priority, application United Kingdom, Jul. 19, 1979, 25175/79
Int. Cl.³ A61K *7/08;* C11D *1/29, 1/78, 3/37*
U.S. Cl. 424—70 5 Claims

1. An aqueous shampoo comprising:

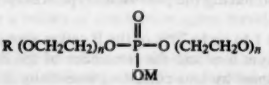
(a) from 5% to 30% by weight of an alkyl sulphate or alkyl ether sulphate detergent;

(b) from 0.1% to 5% by weight of a polyglycol condensation resin which is a hardenable polycondensation product produced by reacting a polyamine compound having from 2 to 10 carbon atoms with an ether of polyoxyalkylene glycol having terminal halogens or hydroxyls and having from 2 to 4 carbon atoms in alkylene units thereof, said polyamine reaction compounds having more than one hydrogen atoms attached to a nitrogen atom and being further reacted with a bifunctional aliphatic compound having functional groups selected from the group consisting of epoxide and α-halo-β-hydroxy-alkyl; and

(c) from 0.1% to 3% by weight of a phosphate ester comprising a monoester of the formula



and or a diester of the formula



wherein

R is a hydrocarbon group having 8 to 22 carbon atoms;

n is 0 or an integer of from 1 to 10; and

M is hydrogen or an alkali metal, ammonium or amine salt forming group.

4,321,257

POTENTIATED MEDICAMENTS

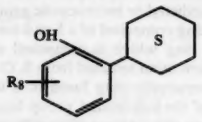
Tibor Sipos, Lebanon, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 890,881, Mar. 27, 1978, Pat. No. 4,197,318, which is a division of Ser. No. 748,868, Dec. 10, 1976, Pat. No. 4,091,090, which is a division of Ser. No. 595,986, Jul. 14, 1975, Pat. No. 4,006,218, which is a continuation of Ser. No. 486,287, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 285,682, Sep. 1, 1972, abandoned. This application Sep. 26, 1979, Ser. No. 79,028

Int. Cl.³ A61K *31/79, 31/05, 31/055*

U.S. Cl. 424—80 15 Claims

1. An antimicrobial composition comprising effective amounts of an antimicrobial agent and a potentiator therefor, wherein said potentiator is at least one cyclohexyl phenol having the structure



where R_8 is hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, hydroxy, halogen, amino, or mono or di C_1 to C_3 alkyl amino, provided that the total number of carbon atoms in the alkyl groups substituted on the amino does not exceed 5, and said antimicrobial agent is a member selected from the group consisting of the antibiotics, bisdiguanides, quaternary ammonium compounds, carbanilides, salicylanilides, hydroxydiphenyls, organo-metallic antiseptics, halogen antiseptics, and iodophores derived from nonionic surface active agents and from polyvinylpyrrolidone.

4,321,258

NON-TOXIC INSECTICIDE

Dorsey S. Dunlap, 136 Elm St., South Williamsport, Pa. 17701

Filed Aug. 13, 1980, Ser. No. 177,602

Int. Cl.³ A01N *25/00*

U.S. Cl. 424—84 5 Claims

1. A composition for mechanically killing insects and the like consisting essentially of:

diatomaceous earth 66% by weight

cane sugar, cornstarch and dextrin 17% by weight

cane molasses and soybean mill feedings 17% by weight.

4,321,259

CONTROLLED IMPROVEMENT OF THE O_2-RELEASE BY INTACT ERYTHROCYTES

Yves-Claude Nicolau, Mulheim-Ruhr, and Klaus Gersonde, Aachen, both of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Kaiser-Wilhelm-Platz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 909,081, May 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 832,867, Sep. 13, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 23,044

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2740053

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 28 Claims

2. A process for the provision of erythrocytes having improved O_2-release which comprises (1) dissolving inositol hexaphosphate in an isotonic buffer solution until the solution is saturated, (2) suspending in this solution, a lipid mixture containing phosphatidylcholine:phosphatidylserine:cholesterol in the mole ratio 10 to 5:4 to 1:10 to 3, (3) subjecting the resulting suspension to ultrasonic disintegration, then (4) centrifuging to separate the supernatant suspension which contains the small inositol hexaphosphate-enriched lipid vesicles, after which (5) human erythrocytes, previously separated from the blood plasma by centrifugation, are resuspended in said supernatant suspension which contains said small inositol hexaphosphate-enriched lipid vesicles and (6) incubating the resulting suspension to effect fusion of said vesicles with said erythrocytes, and (7) washing the now modified intact erythrocytes with isotonic NaCl-solution or isotonic buffer quantitatively removing thereby free inositol hexaphosphate being still outside the erythrocytes and suspending the modified erythrocytes in blood-plasma or blood-plasma substitute.

7. Modified intact erythrocytes of improved O_2-release properties having fused thereto allosteric effectors containing lipid vesicles in which the lipid consists essentially of phosphatidylcholine: a member selected from the group consisting of phsphatidyl serine, stearoylamine, phosphatidic acid, phosphatidyl inositol-phosphate and lysophosphatidyl choline:-cholesterol, in a mol ratio of 10 to 5:5 to 1:10 to 3.

4,321,260

METHOD OF USING GONADORELIN FOR THE TREATMENT OF BENIGN PROSTATIC HYPERPLASIA

Claude Auclair, Soulanges, Canada, assignor to Ayerst, McKenna & Harrison Inc., Montreal, Canada

Filed May 22, 1980, Ser. No. 152,241

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 3 Claims

1. A method of reducing or preventing the undesirable prostatic growth of benign prostatic hyperplasia in a male mammal without affecting testicular growth which comprises parenterally administering to said mammal about 0.035 mg to 9.0 mg per kilogram of body weight per day of a decapeptide of the formula Pyr-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-NH_2 to reduce or prevent said prostatic growth.

4,321,261

IONIC OPHTHALMIC SOLUTIONS

Edward J. Ellis, Georgetown, and Joseph C. Salamone, Marblehead, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 38,703, May 14, 1979, abandoned, which is a continuation of Ser. No. 867,136, Jan. 5, 1978, Pat. No. 4,168,112. This application Jun. 25, 1979, Ser. No. 51,961

Int. Cl.³ A61K *31/72*

U.S. Cl. 424—180 8 Claims

5. A sterile artificial tear solution for treating contact lens surfaces to form a protective coating thereon,

said lens solution having a pH in the range of 6 to 8 and consisting essentially of a cationic cellulosic polymer in aqueous solution with said polymer being present in an amount sufficient to form a thin hydrogel coating on a lens surface of opposite charge.

4,321,262

MEDICAMENT FOR ARTHRITIC CONDITIONS

Harvey L. Burnett, 404 Shirley St., DeRidder, La. 70634

Continuation-in-part of Ser. No. 755,147, Dec. 29, 1976, Pat. No. 4,153,690. This application Apr. 12, 1979, Ser. No. 29,452

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 1 Claim

1. A method for alleviating arthritic pain which comprises administering to the afflicted individual a small, effective, pharmaceutically acceptable, orally ingestible dosage of a medicament containing at least one effective component found in the aqueous extract of the sap-containing portion of the root of Southern Wax Myrtle (*Myrica Cerifera*), said extract being characterized (a) by containing nitrogen-containing components, (b) by showing on analysis after evaporation to dryness, aspartic acid, glutamic acid, alanine, ammonia and arginine as

free amino acids and (c) by yielding as protein hydrolysate, aspartic acid, threonine, serine, glutamic acid, alanine, valine, methionine, leucine, ammonia, histidine and arginine, said dosage being effective for alleviating said arthritic pain.

4,321,263

PSYLLIUM COMPOSITIONS

David R. Powell, and Vithal K. Patel, both of Baudette, Minn., assignors to Rowell Laboratories, Inc., Baudette, Minn.

Filed Nov. 17, 1980, Ser. No. 207,600
Int. Cl.[3] A61K *9/16, 31/74, 31/79, 35/78*
U.S. Cl. 424—195 16 Claims

1. An ingestible granulated psyllium composition consisting essentially of granules of psyllium powder and having at least 90% psyllium content, rendered rapidly dispersible in water by the presence on the surface of the psyllium particles of a coating of an amount up to about 10% by weight of a non-toxic, normally solid, alcohol soluble, water dispersible polyethylene glycol, polyvinylpyrrolidone, or mixture thereof, effective to render the psyllium particles substantially instantly and uniformly dispersible in water.

4,321,264

α-METHYLDOPA COMPOSITIONS

Stanley Vickers, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 14, 1980, Ser. No. 139,913
Int. Cl.[3] A61K *31/615, 31/195*
U.S. Cl. 424—233 7 Claims

1. A pharmaceutical composition for treating hypertension containing (A) L-α-methyl-3,4-dihydroxyphenylalanine and (B) salicylamide wherein the weight ratio of (A):(B) is at least about 4:1.

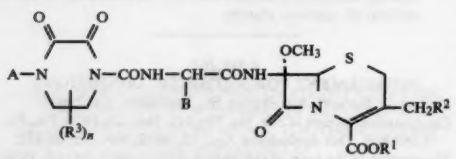
4,321,265

7α-METHOXYCEPHALOSPORINS

Isamu Saikawa; Shuntaro Takano; Hiroyuki Imaizumi; Isamu Takakura; Hirokazu Ochiai; Takashi Yasuda; Hideo Taki; Masaru Tai, and Yutaka Kodama, all of Toyama, Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 926,939, Jul. 21, 1978. This application Feb. 1, 1980, Ser. No. 117,784
Claims priority, application Japan, Jul. 23, 1977, 52-88733; Feb. 2, 1978, 53-9869; Jun. 13, 1978, 53-70417
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.[3] C07D *501/36, 501/25*
U.S. Cl. 424—246 28 Claims

1. A 7α-methoxy-cephalosporin or a salt thereof, said 7α-methoxy-cephalosporin being represented by the formula:



wherein

R^1 represents a hydrogen atom or a carboxyl-protecting group;

R^2 represents a substituted or unsubstituted heterocyclic thio group in which the thio linkage is attached to a carbon atom of a 5 or 6 membered aromatic heterocyclic ring composed of carbon and at least one hetero atom selected from oxygen, sulfur and nitrogen, the heterocyclic moiety of said heterocyclic thio group being composed of said aromatic heterocyclic ring or of said aromatic heterocyclic ring fused to a benzene ring or being triazolopyridyl, purinyl, or pyridine-1-oxide-2-yl, the substituent of the substituted group being selected from a halogen, lower alkyl, phenyl, C_{2-5} alkenyl, hydroxyl, lower alkoxy, lower alkylthio, nitro, cyano, lower alkylamino, di-lower alkylamino, C_{1-10} acylamino, C_{1-10} acyl, C_{1-10} acyloxy, C_{1-10} acyl-lower alkyl, carboxyl, carbamoyl, amino-lower alkyl, N-lower alkylamino-lower alkyl, N,N-di-lower alkylamino-lower alkyl, hydroxy-lower alkyl, hydroxyimino-lower alkyl, lower alkoxy-lower alkyl, carboxy-lower alkyl, sulfo-lower alkyl, sulfo, sulfamoyl-lower alkyl, sulfamoyl, carbamoyl-lower alkyl, carbamoyl-C_{2-5} alkenyl, and N-hydroxycarbamoyl-lower alkyl; R^3 represents a lower alkyl group; n is 0, 1 or 2; A represents a hydrogen atom or a substituted or unsubstituted straight or branched chain C_{1-4} alkyl group, the substituent of the substituted group being selected from halogen, lower alkoxy, cyano, nitro, carboxyl, lower alkoxycarbonyl, lower alkylthio, and C_{1-10} acyl; and B represents a substituted or unsubstituted C_{5-6} cycloalkyl, C_{5-6} cycloalkenyl, C_{5-6} cycloalkadienyl or heterocyclic group, said heterocyclic group being composed of a 5 or 6 membered aromatic heterocyclic ring which is composed of carbon and at least one hetero atom selected from S, O and N, or of said aromatic heterocyclic ring fused to a benzene ring, the substituent of the substituted group being selected from halogen, lower alkyl, lower alkoxy, hydroxyl, C_{1-10} acyl, C_{1-10} acyloxy, mercapto, lower alkylthio, nitro, amino, protected amino, imino, protected imino, and carboxyl.

4,321,266

5-O-CYANOBENZYL-4,5,6,7-TETRAHYDROTHIENO [3,2-C] PYRIDINE

Armand Amselem, Toulouse; Fernand Eloy, Eaunes, and Jean-Pierre Maffrand, Portet, all of France, assignors to Sanofi, Paris, France

Filed Oct. 6, 1980, Ser. No. 193,907
Int. Cl.[3] C07D *495/04;* A61K *31/395*
U.S. Cl. 424—246 4 Claims

1. The free base, 5-o-cyanobenzyl-4,5,6,7-tetrahydrothieno [3,2-c] pyridine.

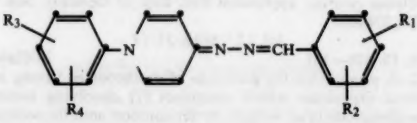
4,321,267

1-SUBSTITUTED-4 (1H)-PYRIDINONE HYDRAZONES ACTIVE AGAINST *GIARDIA LAMBLIA* AND *TRICHOMONAS VAGINALIS*

Ching C. Wang, Watchung, and Michael H. Fisher, Ringoes, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 6, 1980, Ser. No. 194,713
Int. Cl.[3] A61K *31/44*
U.S. Cl. 424—263 6 Claims

1. A method for treating giardiasis and trichomoniasis in humans which comprises the administration to a person in a need of such therapy an amount effective for the treatment of giardiasis and trichomoniasis of a 1-substituted-4(1H)-pyridinone hydrazone of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

(a) R_1 and R_3 are independently halogen, haloalkyl of from 1 to 3 carbon atoms, alkylthio of from 1 to 3 carbon atoms, or cyano; and

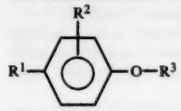
(b) R_2 and R_4 are independently hydrogen or halogen.

4,321,268
CERTAIN SUBSTITUTED PHENYL ESTERS OF NICOTINIC ACID, COMPOSITIONS AND METHODS OF USING SAME

Arthur Scherm, Bad Homburg; Dezsoe Peteri, Hattersheim, and Klaus Hummel, Frankfurt, all of Fed. Rep. of Germany, assignors to Merz & Co., Frankfurt, Fed. Rep. of Germany

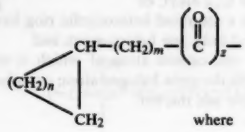
Continuation-in-part of Ser. No. 119,576, Feb. 7, 1980, abandoned. This application Jan. 5, 1981, Ser. No. 222,679
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904757; Mar. 10, 1980, 3009099
Int. Cl.³ C07D *213/55;* A01N *31/455*
U.S. Cl. 424—266 **24 Claims**

1. Compounds having the general formula:



Wherein

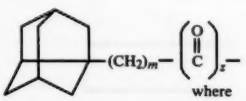
R^1 = (a)



where

n = 3–12
m = 0–1
z = 0–1

(b)



where m = 0–1
and z = 0–1

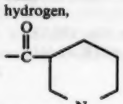
(c) Cumyl
(d) p-Chlorobenzoyl
(e) Hydrogen, but R^1 can only equal hydrogen when R^2 equals Cycloalkyl or Cycloalkylene $(-CH_2-)_n$

and

R^2 = (a) $(-CH_2-)_n$, where n = 0 or 4

(b) Halogen
(c) C_1–C_6-Alkyl or C_3–C_6-cycloalkyl
(d) Methoxy
(e) Ethoxy
(f) Trifluoromethyl
(g) Nitro
(h) hydrogen,

and R^3 =



and pharmaceutically-acceptable acid addition salts therof.

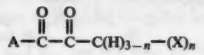
19. Method for the treatment of hyperlipidemia comprising the step of administering to a subject in need of such therapy, by the oral or parenteral route, an effective hyperlipidemic amount of a compound of claim 1.

4,321,269
1-(3-HALO-1,2-DIOXOPROPYL)-CYCLOAMINE COMPOSITIONS AND USE

James R. Wareing, Randolph, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 138,091, Apr. 7, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 218,746
Int. Cl.³ A01N *43/40*
U.S. Cl. 424—267 **19 Claims**

15. A fungicidal or bactericidal composition comprising an inert fungicide or bactericide carrier and a fungicidally or bactericidally effective amount of a compound of the formula:



wherein

n is a whole integer of from 1 to 3,

X is halo having an atomic weight or from about 34 to 80; and

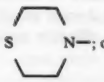
A is:

(a)

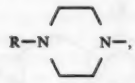
in which m is a whole integer of from 4 to 8;

(b)

(c)



(d)



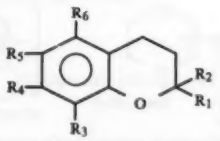
in which R is a hydrogen atom, or alkyl having from 1 to 4 carbon atoms; provided that a surfactant is present when the carrier is a liquid.

4,321,270
SUBSTITUTED CHROMANS

Joseph E. Sundeen, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 29, 1981, Ser. No. 229,415
Int. Cl.³ A61K *31/445;* C07D *405/04, 405/06*
U.S. Cl. 424—267 **12 Claims**

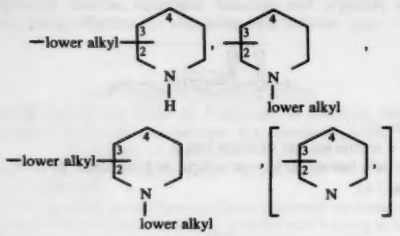
1. A compound of formula



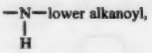
wherein

R_1 is hydrogen, lower alkyl, substituted phenyl wherein the substituent is one or two halogen, lower alkyl, or lower alkoxy groups, phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein the substituent is one or two halogen, lower alkyl, or lower alkoxy groups, or lower alkyl-amino-lower alkyl;

R_2 is

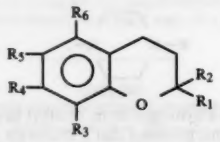


R_3, R_4, R_5 and R_6 each is independently selected from hydrogen, hydroxy, amino, lower alkanoyloxy, —O-lower alkyl,



halogen, lower alkyl, or halo substituted lower alkyl; and salts and hydrates thereof.

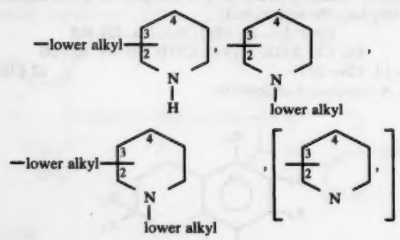
11. A method for treatment of inflammation of joints in mammalian species in need thereof which comprises administering to said mammal an effective amount of a compound having the formula



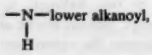
wherein

R_1 is hydrogen, lower alkyl, substituted phenyl wherein the substituent is one or two halogen, lower alkyl, or lower alkoxy groups, phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein the substituent is one or two halogen, lower alkyl, or lower alkoxy groups, or lower alkylamino-lower alkyl;

R_2 is



R_3, R_4, R_5 and R_6 each is independently selected from hydrogen, hydroxy, amino, lower alkanoyloxy, —O-lower alkyl,



halogen, lower alkyl, or halo substituted lower alkyl; and salts and hydrates thereof.

4,321,271

HETEROCYCLIC AND ALIPHATIC GROWTH PROMOTORS

Brian G. McDonald, Mosspark, Scotland, assignor to Beecham Group Limited, England

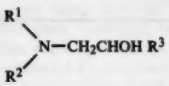
Filed Jun. 30, 1980, Ser. No. 164,159

Claims priority, application United Kingdom, Jul. 10, 1979, 24025/79; Sep. 7, 1979, 31147/79

Int. Cl.³ A61K *31/445, 31/40, 31/13*

U.S. Cl. 424—267 **18 Claims**

10. A method for promoting the growth of ruminants, which comprises administering to the ruminant a growth-promoting effective amount of a compound of formula (I)



(I)

wherein:

R^1 is C_{1-6} alkyl or C_{5-7} cycloalkyl;

R^2 is hydrogen or C_{1-6} alkyl; or

NR^1R^2 represents a saturated heterocyclic ring having 5 to 7 ring atoms and only one hetero-atom; and

R^3 is C_{1-4} alkyl, one carbon atom of which is di- or trihalogenated with the same halogen atom; or a pharmaceutically acceptable salt thereof.

4,321,272

DERIVATIVES OF SUBSTITUTED N-ALKYLIMIDAZOLES

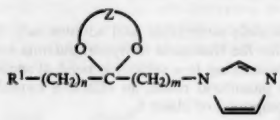
Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 25, 1980, Ser. No. 180,783

Int. Cl.³ C07D *405/06;* **A61K** *31/415*

U.S. Cl. 424—273 R **30 Claims**

1. A compound of the formula



(I)

wherein

R^1 is phenyl optionally substituted by one or more substituents selected from the group consisting of halo, lower alkyl, lower alkoxy and trifluoromethyl;

Z is ethylene or propylene optionally substituted by one or more lower alkyl groups;

m is 1 or 2 and n is 2 or 3 with the proviso that the sum of m and n is 3 or 4;

and the pharmaceutically acceptable acid addition salts thereof.

4,321,273
GERMANIUM-CONTAINING ORGANIC POLYMER AND ITS USE IN THE TREATMENT OF PULMONARY FIBROSIS

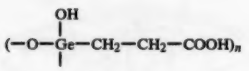
Akira Ishikawa, Tokyo; Yukihito Ishida, Fujisawa; Shiro Ikegami, Funabashi; Hiroshi Satoh, Tokyo, all of Japan; Ryuichi Sato, 2310 Kamikoizumi, Oizumicho, Ora-gun,; Gunma-ken, Japan; Setsuo Tomisawa, and Shigeru Toyoshima, both of Tokyo, Japan, assignors to Ryuichi Sato, Tokyo, Japan

Division of Ser. No. 12,151, Feb. 14, 1979, Pat. No. 4,271,084.
This application Feb. 29, 1980, Ser. No. 125,947
Claims priority, application Japan, Mar. 1, 1978, 53-21992; Mar. 1, 1978, 53-21993
Int. Cl.³ A61K *31/28, 31/74*
U.S. Cl. 424—287 1 Claim

1. A method of treating an animal suffering from pulmonary fibrosis, which comprises; administering to said animal an effective amount to relieve said suffering of a polymer selected from those of the formulae:

$$(=GeCH_2CH_2COOH)_nO_{1.5n}$$

and



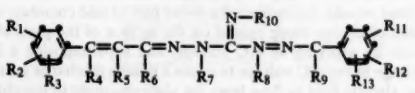
wherein n is an integer greater than 3, inclusive.

4,321,274
SUBSTITUTED 1-(CINNAMYLIDENEAMINO)-3-BENZYLIDENEAMINOGUANIDINES ACTIVE AGAINST *GIARDIA LAMBLIA* AND *TRICHOMONAS VAGINALIS*

Ching C. Wang, Watchung, and Michael H. Fisher, Ringoes, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 6, 1980, Ser. No. 194,714
Int. Cl.³ A61K *31/16, 31/155, 31/255, 31/275*
U.S. Cl. 424—304 2 Claims

1. A method for treating giardiasis and trichomoniasis in humans which comprises the administration to a person in need of such therapy an amount effective for the treatment of giardiasis and trichomoniasis of a 1-(cinnamylideneamino)-3-benzylideneaminoguanidine of the formula:



and a pharmaceutically acceptable acid addition salt thereof wherein:

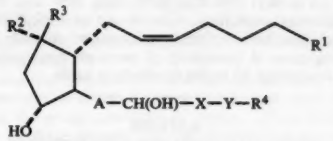
(a) R_1 and R_{11} are each hydrogen, halo, nitro, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, acetyl, carbamoyl, cyano, methylsulfinyl, methylsulfonyl, carbomethoxy or dimethylaminosulfonyl;
(b) R_2 and R_{12} are each hydrogen, halo or nitro;
(c) R_3 and R_{13} are each hydrogen or halo, at least one of R_1, R_2, R_3, R_{11}, R_{12} and R_{13} is a substituent other than hydrogen;
(d) R_4 and R_5 are each hydrogen, halogen or lower alkyl;
(e) R_6, R_7, R_8 and R_9 are each hydrogen or lower alkyl; and
(f) R_{10} is hydrogen, lower alkyl or lower alkanoyl.

4,321,275
METHOD OF INDUCING LUTEOLYSIS USING 16-ARYLOXY-17,18,19,20-TETRANOR-PROSTANOIC ACID DERIVATIVES

Jean Bowler, and Neville S. Crossley, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 248,717, Apr. 28, 1972, abandoned.
This application May 30, 1974, Ser. No. 474,608
Claims priority, application United Kingdom, May 11, 1971, 14139/71
Int. Cl.³ A61K *31/557*
U.S. Cl. 424—317 4 Claims

1. A method of inducing luteolysis in a host requiring such treatment, comprising administering to said host a luteolytically-effective amount of a prostanoic acid derivative of the formula:



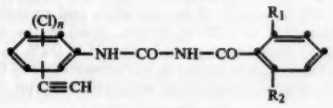
wherein R^1 is carboxy or alkoxycarbonyl of up to 11 carbon atoms, R^2 is hydroxy or alkanoyloxy of 1 to 4 carbon atoms; R^3 is hydrogen; A is trans-vinylene; X is alkylene of 1 to 3 carbon atoms bearing as substituents 0, 1 or 2 alkyls each of 1 to 3 carbon atoms; Y is oxygen; and R^4 is phenyl or naphthyl which is unsubstituted or is substituted by 1 or 2 substituents selected from halogen, alkyl of 1 to 4 carbon atoms and trifluoromethyl; and wherein said derivative has 0 to 1 alkyl group of up to 4 carbon atoms on carbon atom 2, 3 or 4, or for those derivatives wherein R^1 is carboxy, a pharmaceutically-acceptable salt thereof.

4,321,276
PHENYLUREAS

Josef Ehrenfreund, Allschwil, and Achim Roloff, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 14, 1981, Ser. No. 254,337
Claims priority, application Switzerland, Apr. 17, 1980, 2984/80; Oct. 8, 1980, 7508/80
Int. Cl.³ C07C *127/22;* A01N *9/20*
U.S. Cl. 424—322 12 Claims

1. A compound of the formula



wherein R_1 is fluorine, chlorine, bromine, methoxy or methyl, R_2 is hydrogen, fluorine, chlorine, bromine, methoxy or methyl, and n is 0 or 1, whilst the ethynyl radical —C≡CH is in the 3- or 4-position.

11. A method for combating insects, which method comprises applying to said insects or to a locus derived to be protected from said insects an insecticidally effective amount of a compound according to one of claims 1 to 9.

4,321,277

GERMICIDAL USE OF COMPOSITIONS CONTAINING CERTAIN QUATERNARY AMMONIUM COMPOUNDS

Vincent R. Saurino, Boca Raton, Fla., assignor to Research Lab Products, Inc., Palm Beach, Fla.

Continuation of Ser. No. 966,311, Dec. 4, 1978, abandoned, which is a continuation of Ser. No. 783,757, Apr. 1, 1977, abandoned, which is a continuation of Ser. No. 558,654, Mar. 17, 1975, abandoned, which is a continuation of Ser. No. 317,225, Dec. 21, 1972, abandoned. This application Feb. 4, 1980, Ser. No. 118,312

Int. Cl.³ A61K *31/14*

U.S. Cl. 424—329 4 Claims

1. A process for treating the vaginal tract to provide protection against *Neisseria gonorrhea* which comprises contacting it with a safe and effective amount of a germicidal composition containing as the essential active ingredients, 95% of component A, consisting of a mixture of substantially equal proportions of an n-alkyl (5% C_{12}, 60%, C_{14}, 30% c_{16}, 5% C_{18})-dimethyl-benzylammonium chloride and an n-alkyl (68% C_{12}, 32% C_{14})-dimethyl-ethylbenzyl-ammonium chloride and 5% of a component B consisting of octyl-phenoxy-polyethoxy-ethanol containing 10 moles of ethylene oxide.

4,321,278

ANIMAL FEEDSTUFFS AND PROCESS

Gary L. Johanning; Merle E. Muhrer, both of Columbia, and Herschel J. Gaddy, St. Joseph, all of Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Jul. 3, 1979, Ser. No. 54,458

Int. Cl.³ A23k *1/22*

U.S. Cl. 426—69 8 Claims

1. A process for increasing the crude protein content of a ruminant animal feedstuff of relatively low crude protein content comprising the steps of first subjecting the animal feedstuff to chemical treatment with chlorine gas to form an increased concentration of carbonyl groups in said feedstuff and then subjecting the chlorinated feedstuff to chemical treatment with ammonia gas for a time sufficient to react said ammonia with said carbonyl groups to produce a ruminant animal feedstuff of substantially increased crude protein content, both the chlorination and ammoniation steps being carried out in the presence of a mixture of the ruminant animal feedstuff and water, said mixture containing approximately 25% to 35% feedstuff and approximatey 65% to 75% water.

4,321,279

BUTTERED TABLE SYRUP IN POLYOLEFIN BOTTLE

Larry D. Schopf, Battle Creek; Jerome K. Sakowicz, Springfield, and Hugh L. Trenk, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 17, 1980, Ser. No. 197,837

Int. Cl.³ A23L *1/09, 3/34;* B65B *29/00*

U.S. Cl. 426—106 13 Claims

1. A bottled buttered table syrup comprising a polyolefin container containing a table syrup, said table syrup containing at least about 65% by weight sugar solids, butter in an amount of 1–5% by weight based on the weight of the syrup, and from 0.05 to 0.5% by weight of an emulsifier, said emulsifier comprising from 0.01 to 0.2% by weight, based on the weight of the syrup, of locust bean gum, from 0.01 to 0.2% by weight, based on the weight of the syrup, of carrageenin, and from 0.01 to 0.2% by weight, based on the weight of the syrup, of pectin.

4,321,280

TEXTURED OIL SEED PROTEIN PRODUCTS

Pradip K. Roy, Ossining; Alonzo H. R. Feldbrugge, New York, both of N.Y., and David P. Bresnahan, St. Paul, Minn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,468

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—276 10 Claims

1. A process for preparing textured oil seed protein products which comprises: concentrating an aqueous dispersion of fat-containing oil seeds under conditions effective to prevent any significant protein denaturation while allowing sufficient removal of water to obtain a viscous dispersion having a solids concentration of greater than 30% by weight, expressing the dispersion through a die and into an aqueous bath to thereby form a fiber or film protein product, recovering the resulting protein product, and heating the protein product to temper it and more fully coagulate the protein therein.

4,321,281

PROCESS FOR ELECTROSTATIC COATING WITH PULVERIZED MATERIAL AND APPARATUS USED IN SAID PROCESS

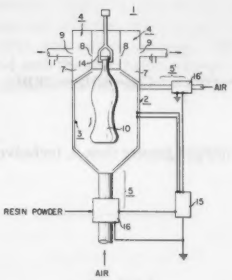
Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 849,533, Nov. 8, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,564

Claims priority, application Japan, Nov. 10, 1976, 51/134161

Int. Cl.³ B05B *5/08;* B05D *1/06*

U.S. Cl. 427—33 8 Claims



1. A process for electrostatically coating an electrically non-conductive object with pulverized material, which comprises the steps of supporting said object maintained at a temperature below the melting point of said pulverized material by means of a holding device in an electrostatic coating chamber having a substantially axially symmetrical shape and equipped with silent discharge plate electrodes on the inside of said chamber; electrically precharging said pulverized material in the same polarity as that of said silent discharge plate electrode; feeding the electrically precharged pulverized material into said chamber from the lower part of said chamber in such a manner as to flow upwards; electrostatically coating said object with said electrically precharged pulverized material; and recovering surplus pulverized material, which is not coated on said object from the upper part of said chamber; said silent discharge being caused on the surface of the plate electrode by applying an AC voltage, and superimposing a DC voltage in the AC voltage to cause a minute discharge current and electric field to flow from the plate electrode to the object being produced.

4,321,282

SURFACE GRATINGS AND A METHOD OF INCREASING THEIR SPATIAL FREQUENCY

Leo F. Johnson, Bedminster, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 6, 1981, Ser. No. 232,154

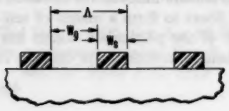
Int. Cl.³ G21K *3/00;* B05D *3/06*

U.S. Cl. 427—38 11 Claims

1. A method of increasing the spatial frequency of a surface structure comprising the steps of;

depositing a mask material on at least a portion of the surface of said structure;

exposing a section of the surface of said structure by removing part of the deposited mask material; and



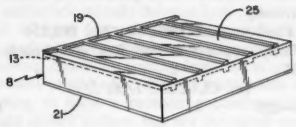
removing material from the exposed section of the surface structure whereby the spatial frequency of the structure is increased.

4,321,283

NICKEL PLATING METHOD

Kirit B. Patel, Tewksbury, and Ronald Gonsiorawski, Danvers, both of Mass., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Oct. 26, 1979, Ser. No. 88,396
Int. Cl.³ H01L *21/288;* C23C *3/00*
U.S. Cl. 427—74 **40 Claims**



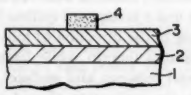
1. A method for plating nickel onto a silicon body wherein said method comprises (a) immersing said silicon body into an aqueous bath comprising nickel chloride and ammonium fluoride or ammonium fluoride and hydrofluoric acid, (b) maintaining said silicon body in said bath so that nickel ions in said bath will be converted to solid nickel and deposited onto said silicon body as an adhering layer thereon, and (c) withdrawing said silicon body from said bath.

4,321,284

MANUFACTURING METHOD FOR SEMICONDUCTOR DEVICE

Hisao Yakushiji, Itami, Japan, assignor to Vlsi Technology Research Association, Kanagawa, Japan

Filed Jan. 7, 1980, Ser. No. 110,169
Claims priority, application Japan, Jan. 10, 1979, 54/2063
Int. Cl.³ H01L *21/88*
U.S. Cl. 427—89 **6 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:
- forming a first interconnection wiring metal layer an a semiconductor substrate;
- forming a silicon nitride layer only on wiring portions of said first wiring metal layer;
- selectively etching said metal layer to leave only said wiring portions on which said silicon nitride layer was formed;
- forming a silicon oxide layer on said silicon nitride layer and on said substrate adjacent said wiring portions;
- selectively removing only the silicon oxide layer overlying said metal wiring portions by etching;
- removing said silicon nitride layer;
- forming an insulating layer on a surface from which said silicon nitride layer was removed;
- forming through-holes in predetermined positions through said insulating layer; and
- forming a second wiring metal layer on said insulating layer, said second wiring metal connecting through said through-holes to said first wiring metal layer.

4,321,285

ELECTROLESS PLATING

Nathan Feldstein, Kendall Park, N.J., assignor to Surface Technology, Inc., Princeton, N.J.

Division of Ser. No. 60,969, Jul. 26, 1979, abandoned, which is a division of Ser. No. 672,044, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Dec. 18, 1980, Ser. No. 217,704
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.
Int. Cl.³ C23C *3/02*
U.S. Cl. 427—97 **23 Claims**

1. A process for electroless plating of a non-conductor substrate comprising
- (a) contacting said substrate with an hydrous oxide colloidal dispersion of a non-precious metal, said metal selected from the group consisting of copper, nickel, cobalt, iron and mixtures thereof, said colloidal dispersion being prepared by the interaction of an hydroxide with ions of said metal, however, said hydroxide being used in less than the stoichiometric amount required to precipitate said metal ions,
- (b) contacting of the treated substrate with a reducing composition, and
- (c) contacting the substrate with a compatible electroless plating bath to deposit a metallic layer.

4,321,286

PROCESS FOR PRODUCING TRANSFER RIBBONS

Michael A. Scott, Huntington, and Albert E. Brown, Glen Cove, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

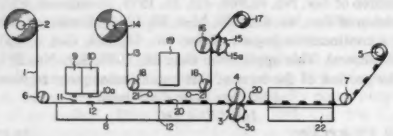
Filed Jul. 12, 1979, Ser. No. 57,068
Int. Cl.³ B41M *5/00, 5/02*
U.S. Cl. 427—152 **6 Claims**

1. Process for producing pressure-sensitive transfer elements which have improved resistance to embossment and breakdown of the ink layer by a type face and resistance to being snagged and torn when used in high-speed typing and printing machines comprising the steps of:
- (a) coating one side of a thin flexible smooth plastic film foundation with a thin wash coating comprising from about 1.5% to 10% by weight of a polymerizable silicone composition dissolved in a volatile organic solvent which is inert to said smooth plastic film foundation;
- (b) heating to a temperature below about 225° F. for less than one minute to provide a thin, substantially continuous slip-permitting, friction-reducing dried silicone layer on said film foundation, said silicone layer having a weight of up to about one pound per 3300 square feet of said film foundation and not substantially increasing the thickness of said film foundation; and
- (c) applying to the opposite side of said plastic film foundation a thin microporous resinous ink layer which is adapted to exude ink to a copy sheet in image from under the effects of imaging pressure exerted against said one side of said foundation by the impact element of a high-speed typing or printing machine, said slip-permitting, friction-reducing cured silicone layer being inert with respect to said microporous ink layer and reducing the effects of friction between said impact element and said transfer element to prevent separation of said microporous resinous ink layer from said film foundation and to prevent snagging and tearing of said thin film foundation.

4,321,287
METHOD OF PRODUCING THERMOLUMINESCENCE DOSIMETER ELEMENT

Seiko Minamide, Nara; Makoto Okuda, Hirakata; Shinobu Nakata, Osaka, and Tadahiro Fukui, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 6, 1980, Ser. No. 147,311
Claims priority, application Japan, May 7, 1979, 54/55451; Jun. 19, 1979, 54/84019[U]
Int. Cl.³ B05D 1/12, 1/32; C09K 11/00
U.S. Cl. 427—157 3 Claims



1. A method of producing a thermoluminescence dosimeter element comprising:

a first step of applying an adhesive agent to drops at regular intervals to the surface of a base tape moved intermittently and spreading said adhesive agent into an adhesive coating of a small, predetermined thickness;

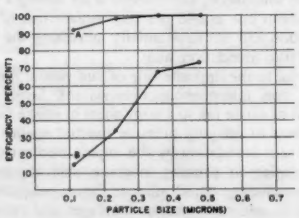
a second step of bringing a masking tape formed in its central portion with a series of openings of a predetermined shape at regular intervals into contact with said base tape and spraying from a sprayer particles of thermoluminescent material through one of said openings of said masking tape onto the surface of said adhesive coating to cause said particles to adhere firmly thereto, said masking tape being spaced apart from said base tape in their horizontal runs and intermittently moved in synchronism with the movement of said base tape; and

a third step of drying said adhesive coating formed on said base tape and said particles of said thermoluminescent material caused to adhere to said adhesive coating whereby said thermoluminescent material can adhere firmly to said base tape.

4,321,288
PROCESS OF MAKING AN IMPROVED FILTER MEDIA

Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 898,578, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 709,564, Jul. 28, 1976, abandoned, which is a division of Ser. No. 598,097, Jul. 22, 1975, Pat. No. 4,007,113, which is a continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application Sep. 10, 1979, Ser. No. 74,376
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.³ B01D 37/02
U.S. Cl. 427—244 5 Claims



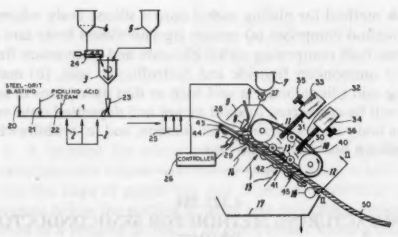
1. A method for preparing an improved filter medium of enhanced electrokinetic capture potential for contaminated liquids having suspended electronegative particles of about 0.1 to 0.7 micron diameter comprising:

forming a filter medium from a dispersion of negatively charged particulate material for filtration and a sufficient amount of fibers to form a matrix of self-bonding fibers, the surface of the particulate which has been modified with a melamine-formaldehyde cationic colloid.

4,321,289
METHOD OF AND APPARATUS FOR THE CLADDING OF STEEL SHEET OR STRIP WITH LOWER MELTING METALS OR ALLOYS

Adalbert Bartsch, Marxen, Fed. Rep. of Germany, assignor to Norddeutsche Affinerie Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 181,156
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1979, 2937188
Int. Cl.³ C23C 1/00, 1/14
U.S. Cl. 427—287 14 Claims



1. A method of cladding a steel strip substrate with a molten material having a melting point less than that of steel, comprising the steps of:

(a) feeding said substrate downwardly along a path inclined to the horizontal while supporting said substrate along said path;

(b) depositing molten material between an upper surface of said substrate and a juxtaposed endless belt surface continuously moving in the direction of movement of said substrate and parallel thereto while laterally confining the molten material between said surfaces between a pair of sliding shoes, the inclination of said surfaces along said path being between 30° and 70° to the horizontal, said belt surface approaching said upper surface of the substrate strip at an upper end of said path to form a bank of said molten material at said upper end, said belt surface exending away from said upper surface of said substrate at a lower location along said path, said substrate continuing along said inclined path below said location;

(c) cooling the molten material between said surfaces along said path to apply a cladding layer of said material in solidified form to said surface of said substrate and bond said layer to said substrate; and

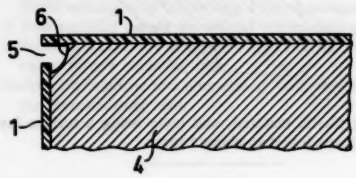
(d) maintaining the region of contact of said belt surface with said molten material under a slightly reducing atmosphere.

4,321,290

PROCESS FOR COATING A METAL ARTICLE ON AND AT AN EDGE

Johan-Petter B. Thams, 69, Grönviksvägen, S-161 40 Bromma, Sweden

Filed Dec. 3, 1979, Ser. No. 99,754
Claims priority, application Sweden, Dec. 5, 1978, 7812499
Int. Cl.³ B05D 3/12, 3/10
U.S. Cl. 427—289 9 Claims



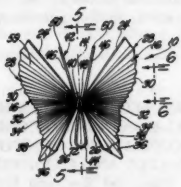
1. A process for coating a metal article on and at an edge where at least two planar surfaces meet to prepare an article having excellent and uniform resistant properties all over its surfaces, said article initially being at least partially coated with a material selected from the group consisting of polymeric materials and polymerizable materials comprising mechanically removing said initial coating from one of said at least two planar surfaces at said edge, etching said surface which is free from coating to form a protecting coating projection and coating said etched surface, but not the initial coating, with a material selected from the group consisting of polymeric materials and polymerizable materials.

4,321,291

DECORATIVE BUTTERFLY AND METHOD OF CONSTRUCTION

David A. Brownell, 332 E. Maplehurst, Ferndale, Mich. 48220

Filed May 19, 1980, Ser. No. 150,797
Int. Cl.³ A63H 33/16
U.S. Cl. 428—16 10 Claims



1. A decorative butterfly (10) comprising; a central portion (12) with a center line (14) passing therethrough, a wing (16) disposed on each side of said center line (14) and extending from said central portion (12), each of said wings (16) having a plurality of pleats extending radially from said central portion (12).

4,321,292

METHOD OF MANUFACTURING SHRINKABLE SLEEVES FROM A CROSS-LINKING PLASTICS MATERIAL

Harald Blomqvist, Vasa, Finland, assignor to Oy Wiik & Höglund AB, Vasa, Finland

Filed Jun. 23, 1980, Ser. No. 162,072
Int. Cl.³ B29D 7/24
U.S. Cl. 428—36 8 Claims

1. Method of manufacturing heat-shrinkable sleeves from cross-linkable plastics materials by extruding a sleeve piece as a tube at a temperature below the cross-linking temperature of the plastic material, but cutting the sleeve piece tube into lengths corresponding substantially to the length of the finished sleeve or a multiple thereof, by heating the cut sleeve piece to the cross-linking temperature of the plastics material while fixed both at its exterior and interior side and by expanding the sleeve piece during simultaneous cooling to the desired sleeve diameter, the improvement comprising, that the sleeve piece is expanded when placed as a loop around two or more rotating parallel rolls which are moved away from each other said two or more rotating parallel rolls are oriented so that their axes are parallel to the longitudinal direction of the sleeve piece.

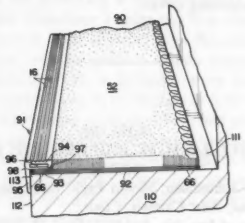
5. A heat shrinkable sleeve as made in accordance with the method of claim 1.

4,321,293

STAIR MAT

Hiromitsu Naka, c/o Tokyo Kenkyusho of Kabushiki Kaisha Naka Gijutsu Kenkyusho, 39, Oaza Shinmachi, Yashio-shi, Saitama-ken, Japan

Filed Nov. 13, 1979, Ser. No. 94,303
Claims priority, application Japan, Nov. 13, 1978, 53/155063; Feb. 21, 1979, 54/20283; Feb. 23, 1979, 54/21763
Int. Cl.³ B32B 3/30; E04F 11/16
U.S. Cl. 428—60 4 Claims



1. A stair mat comprising:
an edge cushioning cover adapted to cover the front edge of a step, including a main body having a longitudinal hollow portion in the inside thereof and a non-skid top surface portion on the upper surface thereof, and a shirt extended downwardly from the front edge of the main body;
a tread mat adapted to be secured onto the tread of the step;
a fixing tongue formed integrally at the front edge of the tread mat; and
a detachable adhesive sheet securing means detachably securing the edge cushioning cover onto the upper surface of the fixing tongue.

4,321,294

STAIR MAT

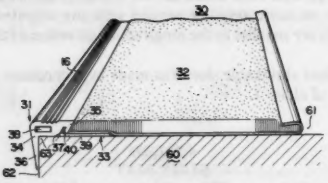
Hiromitsu Naka, c/o Tokyo Kenkyusho of Kabushiki Kaisha Naka Gijutsu Kenkyusho, No. 39, Oaza Shinmachi, Yashio-shi, Saitama-ken, Japan

Filed Nov. 13, 1979, Ser. No. 94,301
Claims priority, application Japan, Nov. 13, 1978, 53/138855; Feb. 16, 1979, 54/17772[U]; Feb. 21, 1979, 54/20284[U]
Int. Cl.³ B32B 3/26; E04F 11/16
U.S. Cl. 428—61 4 Claims

1. A stair mat comprising:
an edge cushioning cover having an L-shaped cross-section adapted to cover the forward edge of a step, including a main body adapted to extend across the front of a step with a non-skid top surface and having at least one catching groove at its under surface and a skirt extending vertically downward from the main body portion and adapted to cover a riser of a step, said L-shaped edge cushioning

cover having an upper layer made of a flexible synthetic resin and a lower layer made of a rigid synthetic resin;

a connecting base sheet member adapted to be fixed on the tread of a step and having at least one hook-shaped rib at the forward edge thereof, said rib or ribs being fitted into the catching groove or grooves of the main body of the L-shaped edge cushioning cover; and



a tread mat secured at the upper surface of the connecting base sheet member, behind the edge cushioning cover, said base sheet member and tread mat being connected to the edge cushioning cover by means of the interlocking arrangement of said rib or ribs of the base sheet member being accommodated into said groove or grooves of the edge cushioning cover.

4,321,295

MODIFIED GRAPHITE AND PROCESS FOR USING SAME

Robert Smith-Johannsen, Menlo Park, Calif., assignor to Ramu International, New Canaan, Conn.

Continuation of Ser. No. 863,972, Dec. 23, 1977, abandoned. This application Dec. 21, 1979, Ser. No. 106,163

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—206 **16 Claims**

1. A hydrophobic substrate having a coating of graphite adhered thereto in the absence of a binding agent, said graphite particles having at least two hydrophobic surfaces, one surface being adhered to the hydrophobic substrate, and another exposed, and a sufficient amount of hydrophilic properties to permit dispersibility of the graphite in a polar liquid, said graphite powder being produced by treating the graphite particles with a non-polar water immiscible material in the liquid or gas state in a sufficient amount to render the net effect of the graphite powder substantially hydrophobic but to retain a sufficient amount of hydrophilic properties of the graphite to permit dispersibility of the graphite in a polar liquid.

4,321,296

GLAZING LAMINATES WITH INTEGRAL ELECTRICAL NETWORK

Gilles Rougier, Cerdon du Loiret, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

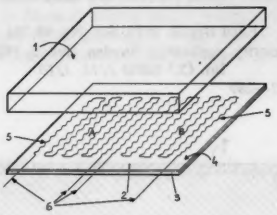
Filed Jul. 10, 1979, Ser. No. 56,245

Claims priority, application France, Jul. 13, 1978, 78 20954

Int. Cl.³ B32B *7/02, 15/02*

U.S. Cl. 428—212 **9 Claims**

1. Laminated glazing comprising an interlayer of transparent or translucent thermoplastic material having a thickness of about 0.02 mm to about 0.3 mm and a network of one or more electrical wires embedded therein one surface of the interlayer being laminated onto a rigid substrate and the other surface being in contact with a layer of non-rigid antilacerative and



self-healing plastic material, said layer being a surface layer with a thickness less than about 1 mm.

4,321,297

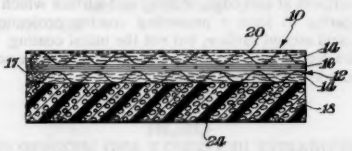
SHEET PACKAGING MATERIAL

Herbert B. Adelman, Wilmington, Del., assignor to The Crowell Corporation, Newport, Del.

Continuation-in-part of Ser. No. 166,079, Jul. 7, 1980, Pat. No. 4,263,360. This application Mar. 23, 1981, Ser. No. 246,372

Int. Cl.³ B32B *7/00, 9/00*

U.S. Cl. 428—238 **14 Claims**



1. A laminated sheet for wrapping around corrodible material, the sheet having a paper layer, a layer of pliable sealed cell micro-porous foam, adhesive material securely bonding the micro-porous foam and paper layers together, and a layer of volatile corrosion inhibitor on the surface of the foam remote from the paper layer, to inhibit corrosion of the wrapped material.

4,321,298

CARBON FABRICS SEQUENTIALLY RESIN COATED WITH (1) A METAL-CONTAINING COMPOSITION AND (2) A BORON-CONTAINING COMPOSITION ARE LAMINATED AND CARBONIZED

Robert C. Shaffer, Playa del Rey, and William L. Tarasen, Lakewood, both of Calif., assignors to Hitco, Irving, Calif.

Filed Feb. 26, 1980, Ser. No. 124,931

Int. Cl.³ B29C *25/00;* **B32B** *9/00, 31/26*

U.S. Cl. 428—242 **57 Claims**

1. A fibrous carbon material impregnated with a thermosetting resin binder, said thermosetting binder including:

a first portion surrounding the fibers comprised of a flexible thermosetting resin coating containing a refractory metal capable of reacting with boron to form a metal boride; and

a second portion coated on top of said first portion comprised of a thermosetting resin containing a boron compound.

9. A carbon-carbon composite comprising a plurality of layers of fibrous carbon material in a carbon matrix, said carbon matrix including metal boride, wherein said resin matrix is formed from:

a first portion of thermosetting resin surrounding the fibers comprised of a flexible thermosetting resin coating containing a refractory metal capable of reacting with boron to form a metal boride; and

a second portion coated on top of said first portion com-

prised of a thermosetting resin containing a boron compound.

39. A method of making a carbon-carbon composite comprising the steps of:

applying a coating of a flexible thermosetting resin which remains flexible upon curing to fibrous carbon material, said resin containing a refractory metal capable of reacting with boron to form a metal boride;

curing the flexible thermosetting resin;

impregnating the fibrous carbon material with a second thermosetting resin containing a boron compound;

at least partially curing the second thermosetting resin;

assembling a plurality of layers of the fibrous carbon material to form a laminate; and

heating the laminate to a temperature sufficient to carbonize the thermosetting resin.

4,321,299

STRONG THIN MEMBRANE STRUCTURE FOR USE AS SOLAR SOIL COMPRISING SUBSTRATE WITH REFLECTIVE COATING ON ONE SURFACE AND AN INFRA RED EMISSIVITY INCREASING COATING ON THE OTHER SURFACE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Robert E. Frazer, La Canada, Calif.

Continuation-in-part of Ser. No. 833,636, Sep. 15, 1977, abandoned. This application Dec. 21, 1979, Ser. No. 106,188

Int. Cl.³ B05D *5/00, 5/06;* **B32B** *15/08, 31/12, 33/00*

U.S. Cl. 428—247 **39 Claims**

1. A thin lightweight membrane structure comprising a substrate consisting of a thin flexible organic film or metallic foil containing a reflective coating on one side of said substrate and an emissivity increasing coating on the opposite of said substrate.

4,321,300

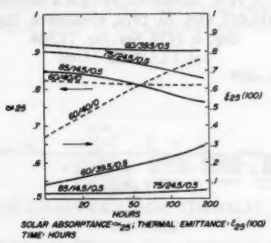
THIN FILM SOLAR ENERGY COLLECTOR

Robert J. Farrauto, Westfield, N.J.; Joseph C. Williams, Botetourt County, Va., and Herbert Myers, South Orange, N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Filed Nov. 12, 1980, Ser. No. 206,125

Int. Cl.³ B32B *9/00, 15/04, 17/06;* **G02B** *5/24*

U.S. Cl. 428—332 **10 Claims**



1. A solar energy collector comprising a solar absorptive film consisting essentially of about 50–90% by weight silver, about 9–49.9% by weight copper oxide, and about 0.1–1.0% by weight rhodium oxide;

a substrate selected from among quartz, silica, glass and metal comprising chromium and iron elements; and

an interlayer of cerium oxide in intimate contact with said solar absorptive film and said substrate.

4,321,301

PROCESS FOR STABILIZING PARTICLES OF PEROXYGENATED COMPOUNDS

Jean Brichard, Vilvoorde, and Jean-Claude Colery, Brussels, both of Belgium, assignors to Interox, Brussels, Belgium

Filed Jan. 10, 1978, Ser. No. 868,334

Claims priority, application Luxembourg, Jan. 10, 1977, 76548

Int. Cl.³ B32B *5/16, 9/00*

U.S. Cl. 428—403 **28 Claims**

1. Process for stabilizing particles of peroxygenated compounds by coating by means of a solid coating agent comprising applying a coating agent which contains orthoboric acid.

4,321,302

PROCESS FOR PRODUCING MAGNETIC POWDER HAVING HIGH COERCIVE FORCE

Shinji Umeki; Toshihiro Hamabata; Kazuaki Onuki, and Kazuo Takada, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,514

Claims priority, application Japan, May 11, 1979, 54/57020

Int. Cl.³ C01G *49/06, 49/08*

U.S. Cl. 428—404 **5 Claims**

4. A process for producing a magnetic iron oxide powder which comprises: dispersing a magnetic iron oxide consisting essentially of an iron oxide selected from the group consisting of magnetite and γ-ferric oxide a silicon component, in an amount of 0.05 to 10 wt %, as Si based on the iron oxide, and a phosphorous component, in an amount of 0.05 to 5 wt %, as P based on the iron oxide, wherein silicon and phosphorus are incorporated in the crystalline structure of the iron oxide, in an aqueous solution of cobalt ion; adding a base to the dispersion so as to produce an alkaline condition; and, heating the dispersion so as to adsorb and diffuse the cobalt ion into the surface layer of the magnetic iron oxide.

4,321,303

MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIUM

Haruyuki Morita; Yuichi Kubota, and Yasuo Imaoka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,618

Claims priority, application Japan, Aug. 11, 1979, 54-102640

Int. Cl.³ C01G *49/08*

U.S. Cl. 428—404 **3 Claims**

1. A magnetic powder for a magnetic recording medium which is obtained by: forming a silica layer on the surface of an acicular iron oxide fine powder selected from the group consisting of α-FeOOH, β-FeOOH, γ-FeOOH, α-Fe_2O_3, γ-Fe_2O_3 and Fe_3O_4 as a core; if the acicular iron oxide powder is selected from the group consisting of α-FeOOH, β-FeOOH and γ-FeOOH, dehydrating and reducing the same to obtain a silica-coated powder of Fe_3O_4; if the acicular iron oxide powder is selected from the group consisting of α-Fe_2O_3 and γ-Fe_2O_3, reducing the same to obtain a silica-coated powder of Fe_3O_4; dispersing said silica-coated powder of Fe_3O_4 in an aqueous solution of ammonia containing cobalt ion and heating the same in an inert gas atmosphere or in a reducing gas atmosphere to deposit cobalt on said silica-coated Fe_3O_4; and recovering the cobalt-modified powder.

2. The magnetic powder for a magnetic recording medium according to claim 1, wherein, prior to dispersion of said silica-coated Fe_3O_4 in said aqueous solution of ammonia containing cobalt ion, said silica-coated Fe_3O_4 is heated in a nitrogen atmosphere at 400°–800° C. for 1 to 6 hours.

4,321,304

BETA-DIKETONE-EPOXY RESIN REACTION PRODUCTS BLENDED WITH MONOMERIC OR POLYMERIC PHOSPHONIUM SALTS USEFUL FOR PROVIDING CORROSION RESISTANCE

Nicholas T. Castellucci, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 193,047
Int. Cl.³ B32B 15/08; B05D 3/02; C08J 3/08; C25D 13/06
U.S. Cl. 428—418 18 Claims

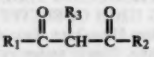
12. A method of providing improved corrosion resistance to ferrous metal substrates comprising the steps of:

(A) applying to the surface of the substrate an aqueous dispersion containing a blend of:

(i) the reaction product of:

(a) an epoxy material;

(b) a beta-diketone of the formula:



wherein R_1, R_2 and R_3, each independently, is a hydrogen or a hydrocarbyl group containing from about 1 to about 18 carbon atoms, selected from the group consisting of alkyl and aryl; and

(c) an onium salt precursor which is an acid salt of a tertiary amine, a tertiary phosphine-acid mixture or a sulfide-acid mixture; with

(ii) at least 2 percent by weight, based on the total weight of (a) and (b), of a monomeric or polymeric phosphonium salt which is different from (i) followed by

(B) directly coating the surface with a coating material.

14. A ferrous metal article obtained by the method of claim 12.

4,321,305

BETA-DIKETONE-EPOXY RESIN REACTION PRODUCTS USEFUL FOR PROVIDING CORROSION RESISTANCE

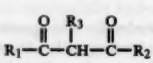
Nicholas T. Castellucci, Pittsburgh, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 193,046
Int. Cl.³ B32B 15/08; B05D 3/02; C08J 3/08; C25D 13/06
U.S. Cl. 428—418 24 Claims

1. A composition of matter comprising the reaction product of:

(A) an epoxy material; and

(B) a beta-diketone of the formula:



wherein R_1, R_2 and R_3, each independently, is a hydrogen or a hydrocarbyl group containing from about 1 to about 18 carbon atoms, selected from the group consisting of alkyl and aryl.

4,321,306

RUBBER STOPPER FOR TIGHT SEALING

Tsukasa Eguchi, 2-9-506 Akabanedai 1-chome, Kita-ku, Tokyo 115, Japan

PCT No. PCT/JP79/00293, § 371 Date Jul. 10, 1980, § 102(e) Date Jul. 10, 1980, PCT Pub. No. WO80/01060, PCT Pub. Date May 29, 1980
PCT Filed Nov. 15, 1979, Ser. No. 201,388
Claims priority, application Japan, Nov. 17, 1978, 53-142484
Int. Cl.³ B32B 27/30; B65D 39/00
U.S. Cl. 428—421 9 Claims

1. A rubber stopper for tight sealing having its surface at least partially coated with a vulcanized film of a propylene-tetrafluoroethylene-glycidyl vinyl ether copolymer rubber containing on a mole basis 40–50% propylene, 50–60% tetrafluoroethylene and 0.01–10% of glycidyl vinyl ether.

4,321,307

LAMINATE INCLUDING POLYMERIC BODY ADHESIVELY BONDED TO IRRADIATED COATING OF PAINT

Robert A. Bragole, Danvers, and Richard A. Weidman, Bedford, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jul. 18, 1980, Ser. No. 170,284
Int. Cl.³ B32B 27/40; B29C 19/02; B05D 3/06
U.S. Cl. 428—423.1 11 Claims

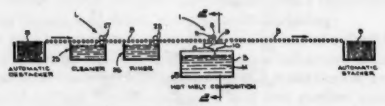
1. A laminate consisting essentially of a substrate carrying a coating of paint which is provided by a paint comprising a synthetic polymer having at least some hydrogen on a carbon chain and the coalesced residue of the paint has a critical surface tension of wetting of about 35 dynes per centimeter or less and where the coating of paint is irradiated to increase said critical surface tension of wetting by at least about 5 dynes per centimeter and a polymeric body bonded to said irradiated paint coating by a polyurethane adhesive.

4,321,308

METAL WORKPIECES COATED WITH ESTER-BASED HOT MELT METAL WORKING LUBRICANTS

Richard W. Jahnke, Mentor-On-The-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 922,704, Jul. 7, 1978, abandoned, which is a continuation of Ser. No. 731,060, Oct. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 547,896, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 513,617, Oct. 10, 1974, abandoned. This application Sep. 4, 1979, Ser. No. 72,546
Int. Cl.³ B32B 15/08
U.S. Cl. 428—469 11 Claims



1. A metal workpiece having on the surface thereof a film of a lubricating composition which provides lubricity thereto and which comprises: (1) at least one ester of an aliphatic polycarboxylic acid having about 4–25 carbon atoms and an aliphatic monohydric alcohol having at least about 10 carbon atoms; and (2) from about 3% to about 15% by weight of at least one aliphatic dicarboxylic acid containing at least about 8 carbon atoms, or an anhydride or lithium salt thereof; said composition melting within the range of about 30°–100° C.

4,321,309

HEAT-SENSITIVE RECORDING MATERIAL

Hisashi Mino; Masao Matsukawa, and Minematsu Nagashima, all of Higashimatsuyama, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,416
Claims priority, application Japan, Jun. 1, 197[illegible], 54/67425
Int. Cl.[3] B41M 5/18
U.S. Cl. 428—522 1 Claim

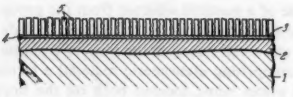
1. A heat-sensitive recording material having a heat-sensitive layer comprising a leuco dye and a phenolic compound used as a developer, said heat-sensitive layer containing as a binding agent methyl cellulose and at least one of polyvinyl alcohol, oxidized starch and etherized starch, wherein the weight ratio of methyl cellulose relative to the total amount of binding agent is between 2:98 and 10:90.

4,321,310

COLUMNAR GRAIN CERAMIC THERMAL BARRIER COATINGS ON POLISHED SUBSTRATES

Nicholas E. Ulion, Marlborough, and Duane L. Ruckle, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1980, Ser. No. 109,955
Int. Cl.[3] B32B 3/24, 15/14
U.S. Cl. 428—612 5 Claims



1. In a superalloy article having a thermal barrier coating which comprises: the superalloy substrate, an adherent dense MCrAlY coating on the substrate (in which M is selected from the group consisting of iron, nickel, cobalt and mixtures of nickel and cobalt), an alumina layer on the MCrAlY surface, and an adherent columnar ceramic coating on the aluminum layer with the columns being oriented substantially perpendicular to the alumina layer; the improvement which comprises: a polished interface between the MCrAlY layer and the alumina layer said polished interface having a roughness which is less than about 25 microinches RMS whereby the adherence of the columnar ceramic layer to the alumina layer is substantially increased.

4,321,311

COLUMNAR GRAIN CERAMIC THERMAL BARRIER COATINGS

Thomas E. Strangman, Phoenix, Ariz., assignor to United Technologies Corporation, Hartford, Conn.

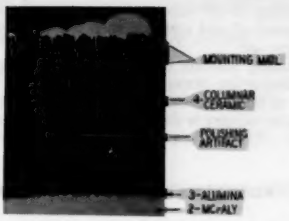
Filed Jan. 7, 1980, Ser. No. 109,956
Int. Cl.[3] B32B 33/00
U.S. Cl. 428—623 5 Claims

1. A superalloy article having an adherent durable ceramic thermal barrier coating including:

a. a superalloy substrate,

b. an adherent dense coating consisting essentially of MCrAlY on the substrate where M is selected from the group consisting of iron, nickel, cobalt and mixtures of nickel and cobalt,

c. an alumina layer on the MCrAlY coating surface,



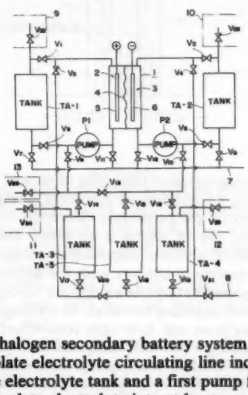
d. an adherent columnar layer, consisting essentially of ceramic, on the alumina layer.

4,321,312

METAL-HALOGEN SECONDARY BATTERY SYSTEM

Toshinobu Fujii, Hino; Takashi Hirose, Zushi, and Naoki Kondo, Yokohama, all of Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,093
Claims priority, application Japan, Nov. 14, 1979, 54-146393
Int. Cl.[3] H01M 10/54, 12/02
U.S. Cl. 429—12 7 Claims



1. A metal-halogen secondary battery system comprising:

a positive plate electrolyte circulating line including a positive plate electrolyte tank and a first pump for circulating a positive plate electrolyte into at least one positive plate galvanic reaction chamber;

a negative plate electrolyte circulating line including a negative plate electrolyte tank and a second pump for circulating a negative plate electrolyte into at least one negative plate galvanic reaction chamber;

an electrolyte discharge pipe line connected to each of said positive and negative plate galvanic reaction chambers through a discharging on-off valve so as to discharge said positive and negative plate electrolytes in said positive and negative plate galvanic reaction chambers to the outside of said electrolyte circulating lines;

a positive plate galvanic reaction chamber cleaning line established by connecting, in place of said positive plate electrolyte tank, a positive plate galvanic reaction chamber cleaning solution tank to said positive plate galvanic reaction chamber through said first pump and first change-over on-off valve means;

a negative plate galvanic reaction chamber cleaning line established by connecting, in place of said negative plate electrolyte tank, a negative plate galvanic reaction cham-

ber cleaning solution tank to said negative plate galvanic reaction chamber through said second pump and second change-over on-off valve means;

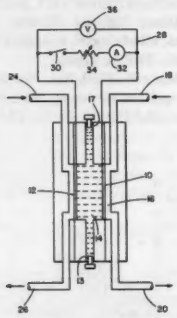
a deionized water circulating line established by connecting a deionized water tank to said cleaning line through connecting on-off valves so as to circulate deionized water instead of said cleaning solutions through said cleaning lines; and

a cleaning solution discharge pipe line connected to said cleaning line through a third discharging on-off valve so as to discharge said cleaning solutions or said deionized water existing in said cleaning lines to the outside thereof.

4,321,313
ELECTROGENERATIVE REDUCTION OF NITROGEN OXIDES

Stanley H. Langer, Madison, Wis., and Kevin T. Pate, Clifton Park, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 23, 1980, Ser. No. 152,728
Int. Cl.³ H01M 8/00
U.S. Cl. 429—13 **12 Claims**



1. The electrogenerative reduction of an acid gas including, coupled with a by-product of electrical energy comprising disposing a pair of gas permeable electrodes closely adjacent one to another, one of which is an anode and the other of which is a catalytic cathode, disposing a hydrogen ion permeable liquid electrolyte in contact with the adjacent surfaces of the electrodes, connecting the electrodes through an external electrical circuit, exposing the anode to hydrogen for reaction to produce electrons and hydrogen ions which pass into the electrolyte, passing a gas containing the acid gas into contact with the cathode while maintaining the potential below 0.4 volts for reaction with hydrogen ions traveling through the electrolyte from the anode to the cathode to produce hydroxylamine (NH_2OH) and ammonia (NH_3) in accordance with the equations:

$$2NO+6H^{+}+6e \rightarrow 2NH_2OH$$

$$2\,NO+10H^{+}+10e \rightarrow 2NH_3+2H_2O$$

removing electrolyte from between the electrodes, and recovering hydroxylamine and ammonia from the displaced electrolyte.

4,321,314
NON-AQUEOUS CELL SAFETY

William L. Bowden, Nashua, and Peter R. Moses, Windham, both of N.H., assignors to Duracell International Inc., Bethel, Conn.

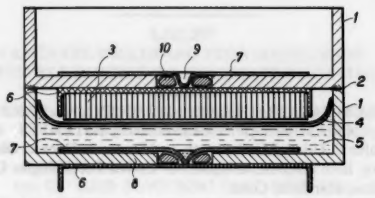
Filed Sep. 2, 1980, Ser. No. 182,897
Int. Cl.³ H01M 10/44
U.S. Cl. 429—50 **15 Claims**

1. A method for improving the safety of a nonaqueous electrochemical cell containing an electrolyte system comprising an alkali or alkaline earth metal electrolyte salt, a normally volatile solvent and a second solvent, said method comprising the steps of forming a stoichiometric complex of said salt and said volatile solvent and adding said normally volatile solvent to said cell substantially only in said complexed form by solvation thereof within said second solvent, whereby said cell is substantially free of uncomplexed normally volatile solvent.

4,321,315
ALKALINE BATTERY

Per J. T. Jensen, Slangerup, Denmark, assignor to A/S Hellesens, Soborg, Denmark

Filed May 28, 1980, Ser. No. 154,056
Int. Cl.³ H01M 2/06
U.S. Cl. 429—152 **5 Claims**

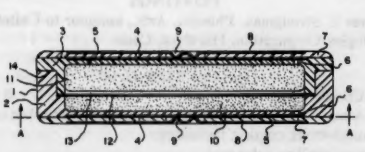


1. A battery comprising at least two flat cells stacked on each other and integrally connected along the circumference, said cells each comprising a zinc anode, an alkaline electrolyte, a cathode of a material selected from the group consisting of mercuric oxide, mercury or manganese dioxide or a mixture thereof, and a cell casing in the form of a plastic cup having a bottom comprising elastomeric material a terminal plate, the terminal plates being located both on the upper and lower surfaces of the bottom of the upper cup and abutting a substantial portion of said surfaces, at least one of said terminal plates comprising a plurality of projecting knobs, each knob extending through an aperture located in the bottom of the upper cut and being relatively small relative to the diameter of said bottom, each knob furthermore being conneted to the other terminal plate in such a manner that the plates squeeze about and under pressure abut the material in the bottom of the cup so as to form a pressure seal between the terminal plates and the elastomeric material, and a sealing ring located in said aperture and surrounding said knobs, the sealing ring being deformed by the pressure of the terminal plates.

4,321,316
TIGHTLY SEALED GALVANIC ELEMENT

Thomas Kühl, Eppstein, Fed. Rep. of Germany, assignor to Varta Batterie, Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,487
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 2936857
Int. Cl.³ H01M 2/08
U.S. Cl. 429—174 **6 Claims**



1. A galvanic element with tightly sealed housing which

contains the electrodes, the separator and the electrolyte and which is provided with connector terminals, said element comprising

an internal and an external connector terminal for at least one electrode polarity, and

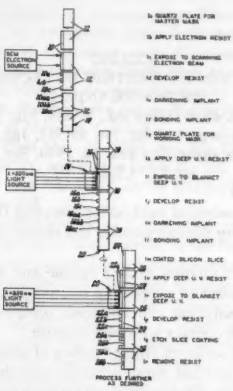
a labyrinth-like conductive path which electrically interconnects the two connector terminals,

said path being positioned within insulating material inside the housing wall.

4,321,317
HIGH RESOLUTION LITHOGRAPHY SYSTEM FOR MICROELECTRONIC FABRICATION

Bernard A. MacIver, Lathrup Village, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1980, Ser. No. 144,578
Int. Cl.³ B05D *3/06*; G03C *5/00*
U.S. Cl. 430—5 **5 Claims**



1. A lithographic process for manufacturing semiconductor devices that provides etching resist resolutions of about 0.7–1.0 micrometer:

patterning a transparent resist on a first transparent substrate by exposure to an electron beam;

subjecting the resist to two successive ion implantations at successively lower energies to successively reduce its transmittancy of deep ultraviolet light and increase its adhesion to its substrate, effective to form a master mask having a resolution below about 0.7 micrometer;

patterning a transparent resist on a second transparent substrate by exposure to deep ultraviolet light through said master mask;

subjecting the latter resist to two successive ion implantations to reduce its transmittancy of deep ultraviolet light and increase its adhesion to its substrate, effective to form a working mask having a resolution of about 0.7–1.0 micrometer;

patterning a transparent resist on a semiconductor material slice by exposure of the last-mentioned resist to deep ultraviolet light through said working mask;

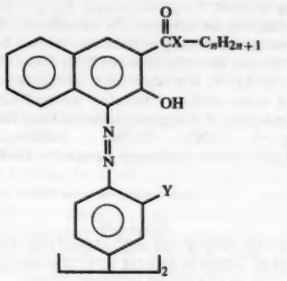
etching surface portions of said slice not convered by said patterned resist; and removing the patterned resist on said slice for further processing of said slice.

4,321,318
DISAZO PHOTOCONDUCTOR AND PROCESS OF MANUFACTURE OF ELECTROPHOTOGRAPHIC ELEMENT

Howard W. Anderson, and Ronald H. Levin, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1980, Ser. No. 219,769
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—59 **8 Claims**

1. A layered xerographic photoconductor having a charge generating layer containing a photosensitive dye molecule which is soluble in a chlorinated organic solvent, the dye molecule being



X = O,NH
n ≧ 12
Y = H,Cl,OMe

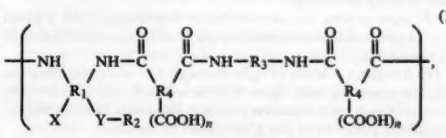
and a P-type transport layer.

4,321,319
PHOTOSENSITIVE COMPOSITIONS CONTAINING POLYAMIDES ACID WITH PHOTOSENSITIVE GROUPS

Fusaji Shoji; Issei Takemoto; Hitoshi Yokono, all of Yokohama, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

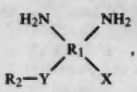
PCT No. PCT/JP79/00246, § 371 Date May 22, 1980, § 102(e) Date May 22, 1980, PCT Pub. No. WO80/00706, PCT Pub. Date Apr. 17, 1980
PCT Filed Sep. 26, 1979, Ser. No. 198,952
Claims priority, application Japan, Sep. 29, 1978, 53-119218; Sep. 29, 1978, 53-119219; Apr. 11, 1979, 54-43022
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—270 **7 Claims**

1. A photosensitive polymer composition characterized in that it is a blend of a photosensitive polyamide acid intermediate solution and a sensitizer therefor, the solution containing 0.1 to 40% by weight of a polyamide acid and 99.9 to 60% by weight of an organic solvent, with the sensitizer in an amount of 0.5 to 20% by weight based on the polyamide acid, said polyamide acid having a repeating unit of the formula



(1)

and being obtained from a diamine, having a photosensitive group, of the formula



a diamine, having no photosensitive group, of the formula

$H_2N—R_3—NH_2$,

and at least one compound of a tetracarboxylic acid dianhydride and a tricarboxylic acid anhydride monohalide, the proportion of the former diamine and the latter diamine used being 100 to 5% by weight and 0 to 95% by weight, respectively;

in all of the formulae R_1 is a trivalent or tetravalent group having at least 2 carbon atoms, R_2 is a photosensitive group having an ethylenically unsaturated bond, R_3 is a divalent group having at least two carbon atoms and the adjacent two amino groups are bound to different carbon atoms in R_3, R_4 is a tetravalent group having at least 4 carbon atoms and/or a trivalent group having at least 2 carbon atoms, Y is a group selected from the group consisting of —COO—, CONH—, —CO—, —O—, and $—CH_2O—$, X is a hydrogen atom or $—Y—R_2$, and n is 1 or 2.

4,321,320

PROCESS FOR SURFACE IMPROVEMENT OF SURPRINT PROOF INVOLVES EXPOSURE THRU HALFTONE SCREEN TINT

Albert P. Romano, Pitman, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 23, 1980, Ser. No. 189,828
Int. Cl.³ G03C *7/14*
U.S. Cl. 430—290 **11 Claims**

1. In a process for modifying a tacky surface of a surprint multicolor proof having at least two nonplanar, nonsilver halide, negative-working colored photoimaged elements sequentially bonded to a support, and a photosensitive tacky layer present as the outer layer of the proof which comprises

(1) applying to the tacky surface an admixture of particular material and carrier particles, the ratio in the admixture of the average particle diameter of carrier particles to that of the particulate material in the admixture being greater than 2 and the weight ratio of particulate material to carrier particles being less than 1, and

(2) removing excess particulate material and the carrier particles from the tacky surface,

the improvement wherein prior to application to the tacky surface of the admixture of particulate material and carrier particles the photosensitive tacky layer is exposed through a screen tint.

4,321,321

METHOD OF PRODUCING COLOR SEPARATION NEGATIVES USING CONTRAST REDUCING FILTER

Joseph E. Moore, Rte. 8, Box 91, Northport, Ala. 35476

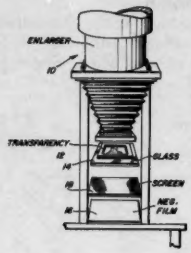
Filed Nov. 7, 1980, Ser. No. 204,995
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—356 **5 Claims**

1. The method of preparing color separation negatives for color printing reproduction of a positive color transparency, said method including:

(A) superposing the positive color transparency on a panel of photochromic (sensitive) glass to form a laminate-type assembly;

(B) directing a beam of light through the assembly from the transparency side thereof with a beam intensity and for sufficient time duration to cause the more heavily illuminated portions of the glass panel to darken;

(C) enlarger exposing a trial color separation negative film sheet through said assembly and a half-tone screen (independent of a mask), with sufficient exposure time and light intensity to properly expose those areas of the film sheet corresponding to the greater density detail areas of the transparency to be reproduced;



(D) developing the trial film sheet with such developing time and developer strength to achieve the desired "dot size" in said areas as well as in the areas of the resultant trial color separation negative corresponding to the lesser dense areas of the color transparency.

4,321,322

PULSED VOLTAMMETRIC DETECTION OF MICROORGANISMS

Joseph E. Ahnell, 4519 Hydes Rd., Hydes, Md. 21082

Continuation-in-part of Ser. No. 49,561, Jun. 18, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,507
Int. Cl.³ C12Q *1/04*
U.S. Cl. 435—34 **17 Claims**

1. An electroanalytical method for detecting the presence of oxygen-consuming microorganisms in a sample comprising the steps of:

(a) providing a mixture of said sample and a fluid culture medium capable of supporting microorganism growth in an electroanalytical cell equipped with two electrodes which are in contact with said mixture;

(b) applying a series of voltage pulses of substantially constant amplitude and duration across said electrodes; and

(c) measuring the resulting current through said cell prior to the trailing edge of each of said applied voltage pulses;

the presence of oxygen-consuming microorganisms being indicated by a decrease in cell current which is a function of the dissolved oxygen content of said mixture.

4,321,323

CARBOHYDRATE PROCESS

John A. Maselli, Wilton, and Robert O. Horwath, Westport, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,758
Int. Cl.³ C12P *7/26, 19/02*
U.S. Cl. 435—105 **11 Claims**

1. A method of producing glucosone which comprises enzymatically oxidizing glucose with glucose-2-oxidase in a first zone to provide glucosone and hydrogen peroxide therein and separating hydrogen peroxide from said first zone through a semi-permeable membrane into a second zone while substantially retaining the glucosone in said first zone, said membrane being permeable only to compounds of molecular weight of less than about 100.

4,321,324

PROCESS FOR MAKING GLUCOSONE

John A. Maselli, Wilton, and Robert O. Horwath, Westport, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,763
Int. Cl.[3] C12P 7/26, 17/02, 19/02
U.S. Cl. 435—105 8 Claims

1. A method of producing glucosone which comprises enzymatically oxidizing glucose with glucose-2-oxidase in a first zone to provide glucosone and hydrogen peroxide therein, separating hydrogen peroxide from said first zone through a semi-permeable membrane into a second zone while substantially retaining the glucosone in said first zone and reacting an alkene with said hydrogen peroxide in said second zone to form oxygenated products of said alkene, said membrane being permeable only to compounds of a molecular weight of less than about 100.

4,321,325

PROCESS FOR PRODUCING L-THREONINE

Vladimir G. Debabov, ulitsa Miklukho-Maklaya, 43, kv. 57; Nelli I. Zhdanova, Leningradskoe shosse, 112, korpus 3, kv. 748; Alexandr K. Sokolov, Levshinsky, Maly pereulok, 14/9, kv. 113; Vitaly A. Livshits, ulitsa Kirovogradskaya, 24, korpus 3, kv. 8; Jury I. Kozlov, Yasenevo, Vtoroi mikroraion, korpus 3, kv. 178; Evgeny M. Khurges, ulitsa Tikhvinskaya, 1/13, kv. 16; Nikolai K. Yankovsky, ulitsa Radischevskaya, 13/15, kv. 59; Mikhail M. Gusyatiner, ulitsa Chertanovskaya, 8, korpus 1, kv. 66; Albert F. Sholin, Teply Stan, 1a mikroraion, korpus 18, kv. 100; Viktor P. Antipov, Suschevsky val, 22, kv. 28, and Tamara M. Pozdnyakova, ulitsa Dorozhnaya, 20, korpus 3, kv. 50, all of Moscow, U.S.S.R.

Filed Mar. 24, 1980, Ser. No. 133,284
Claims priority, application U.S.S.R., Jul. 13, 1978, 2781356
Int. Cl.[3] C12P 13/08; C12N 15/00
U.S. Cl. 435—115 4 Claims

1. A process for producing L-threonine, consisting in that an L-threonine producer is cultivated, in the capacity of which is used the *Escherichia coli* strain VNIIgenetika M-1 deposited in the Central museum of commercial microorganisms under the All-Union Research Institute for Genetics and Selection of Commercial Microorganisms at a registration No. IIMIIB-1856, said strain having been selected on the basis of natural variability of the *Escherichia coli* strain VNIIgenetika VL 334/pYN7), obtained by virtue of the genetic engineering techniques through increasing the dose of mutant genes capable of a higher rate of L-threonine production, by introducing a multicopy hybrid plasmid carrying said genes, into a mutant recipient strain, said producer being cultivated at 30° to 40° C. on a nutrient medium, containing carbon and nitrogen sources and some mineral salts, in the presence of an antibiotic penicillin, resistance to which is accounted for by said hybrid plasmid; the cultivation having been terminated, the resultant biomass is separated from the culture fluid, and the end product is isolated.

4,321,326

PROCESS FOR PREPARING ANTIBIOTICS

Richard B. Sykes, Belle Mead, and William L. Parker, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 25, 1981, Ser. No. 238,288
Int. Cl.[3] C12P 17/10
U.S. Cl. 435—121 2 Claims

1. A process for the preparation of the antibiotic substance EM5400 which comprises culturing aerobically *Agrobacterium radiobacter* A.T.C.C. No. 31700 in a culture medium containing carbon and nitrogen sources until EM5400 is accumulated, and then recovering the EM5400 from the medium.

4,321,327

PREPARATION OF SPHERICAL SHAPED MYCELIAL PELLETS

Li F. Chen; Cheng S. Gong, and George T. Tsao, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Dec. 6, 1979, Ser. No. 100,816
Int. Cl.[3] C12P 7/06, 1/02; C12N 11/02, 11/12
U.S. Cl. 435—161 28 Claims

1. A process for the preparation of biologically active mycelial pellets having a physical support core which comprises the steps of:

(a) dissolving a hydrolyzable cellulose derivative on an inert organic, water-miscible solvent to form a solution having a density greater than that of a precipitation solution;

(b) mixing spores of a mycelial microorganism with said solution and distributing the resulting solution in the form of droplets into a precipitation solution or cool air whereby said cellulose derivative is precipitated in the form of uniformly porous beads, said beads containing said spores;

(c) separating the precipitated beads from said precipitation solution if used;

(d) incubating the precipitated porous beads in an aqueous culture medium for a period of time sufficient to produce a round pellet characterized by a rigid spherical porous bead core surrounded by a porous integral webbed layer, said layer forming a spherical encasement of structural integrity about the rigid core and being composed of filamentous hyphae of a mycelial microorganism.

11. A process for the preparation of biologically active mycelial microorganism pellets which comprise the steps of:

(a) dissolving agar in hot water to form an agar solution;

(b) cooling the agar solution to a temperature of greater than 45° C. but below the temperature at which the spores added in step (c) would be killed;

(c) mixing the agar solution of step (b) with spores of a mycelial microorganism and dispersing the resulting mixture in the form of droplets into cool air or an aqueous precipitation solution at a temperature below 45° C. whereby said agar is precipitated in the form of uniform beads containing said spores;

(d) incubating the agar beads in an aqueous culture medium for a period of time sufficient to produce a round pellet characterized by a rigid round agar core surrounded by a porous integral webbed layer, said layer forming a spherical encasement of structural integrity about the rigid core and being composed of filamentous hyphae of a mycelial microorganism.

4,321,328

PROCESS FOR MAKING ETHANOL AND FUEL PRODUCT

William H. Hoge, R.D. 2, Tuccamirgan Rd., Flemington, N.J. 08822

Filed Dec. 5, 1980, Ser. No. 213,363
Int. Cl.[3] C12P 7/10
U.S. Cl. 435—165 8 Claims

1. A continuous process for the production of ethanol, useful as a fuel, from cellulosic-containing materials which comprises the steps of:

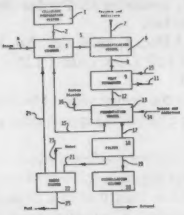
(a) forming a slurry mass of cellulosic material by mechanically defibering said material in a liquid mixture comprising recycled ethanol-containing beer;

(b) subjecting said slurry mass to saccharification reaction in the presence of enzyme to form fermentable sugars from the mixture;

(c) subjecting said fermentable sugar mixture at a suitable temperature to fermentation reaction with added yeast to produce an ethanol-containing beer; said beer additionally containing unreactive cellulosic materials;

(d) separating a portion of the ethanol-containing solution and dregs;

(e) recycling a portion of the product of step (c) back through said saccharification step and fermentation reaction step; and
(f) subjecting the product resulting from step (e) to distillation



to recover ethanol whereby the concentration of ethanol during fermentation and subsequent distillation treatment is substantially increased and the recovery of ethanol enhanced.

4,321,329
SACCHAROPOLYSPORA CULTURE

Howard A. Whaley, Portage, and John H. Coats, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

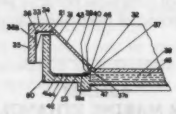
Division of Ser. No. 81,211, Oct. 2, 1979, Pat. No. 4,293,651.
This application Oct. 6, 1980, Ser. No. 194,635
Int. Cl.³ C12N *1/20*
U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of the microorganism *Saccharopolyspora hirsuta* strain 367, having the identifying characteristics of NRRL 12045, said culture being capable of producing the antibiotic U-59,760 in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

4,321,330
TISSUE CULTURE DEVICE

Fraser L. Baker, 6227 Orange St., Los Angeles, Calif. 90048, and John H. Baumann, 836 Wartman Ave., Kingston, Ontario, Canada (K7M 4M5)

Filed Apr. 4, 1980, Ser. No. 137,275
Int. Cl.³ C12M *1/20, 3/00*
U.S. Cl. 435—301 **10 Claims**



1. A tissue culture device comprising in combination a cover and a culture dish, said cover comprising a substantially flat, transparent bottom window having a lower surface and a peripheral edge, an inverted, peripheral, U-shaped flange on said bottom window having an inner wall extending upward from said peripheral edge of said bottom window and a downward depending outer wall, means to facilitate flow of fluid along said lower surface of said bottom window into said inverted U-shaped flange comprising a convex curve on said peripheral edge of said bottom window connecting said lower surface of said bottom window with said inner wall, means for centering said cover on said culture dish comprising at least three downwardly depending ribs located within said inverted U-shaped flange, standoff means for spacing said cover and said culture dish a predetermined distance apart from one another, said culture dish comprising a substantially flat base window having an upper surface and a lower surface, said base window having a peripheral, annular, vertically upward extending wall, said wall having an upper edge ending in a narrow lip, an upstanding, peripheral, U-shaped flange surrounding said vertically upward extending wall and forming a shallow fluid reservoir therearound, said transparent base window and said vertically upward extending wall forming a culture chamber substantially centrally in said culture dish, said standoff means also comprising means for providing access for ambient atmosphere to said fluid reservoir, an annular, peripheral outer wall of said upstanding U-shaped flange extending upward beyond said lip, said upward extending, outer wall having an upper supporting edge, said cover being adapted to rest on said upper supporting edge, said inverted U-shaped flange of said cover bridging said upward extending outer wall of said culture dish, said upward extending outer wall being of a height suitable to provide a predetermined narrow gap between said lip and said lower surface of said transparent bottom window of said cover, at least 2 oppositely disposed handling lugs extending radially outward from base of said outer wall of said culture dish to a location beyond said downward depending outer wall of said cover, each said lug having an upward extending portion extending up outside said cover, said lugs being adapted to permit said culture dish to be grapsed and moved without disturbing said cover, located on said culture dish, means to facilitate rise of fluid in said reservoir toward said lip, means to facilitate detachment of said base window from said culture dish, means for referencing specific culture locations on said base window and means for locating and re-locating said culture dish in same repeat position on a microscope stage.

4,321,331
HIGH DENSITY ION EXCHANGE RESINS FROM HALOALKYLATED AROMATIC POLYMER

Alexander H. Widiger, Jr.; Osro W. Randall, III, and Steven M. Pulver, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1978, Ser. No. 958,451
Int. Cl.³ C08F *8/32, 8/30, 8/22, 8/20*
U.S. Cl. 521—32 **19 Claims**

1. A method for increasing the density of a cross-linked haloalkylated, monovinylidene aromatic polymer, said method comprising the step of contacting the haloalkylated polymer with a brominating agent and a Friedel-Crafts catalyst under conditions sufficient to brominate the haloalkylated polymer such that the density of the haloalkylated polymer is increased and the ratio of the number of haloalkyl groups pendant to the polymer following the halogenation to the number of haloalkyl groups pendant to said polymer prior to halogenation is at least about 0.6.

4,321,332
POLYESTER RESIN GRANULES AND PROCESS

Michael P. Beresford, 36 Moody St., North Balwyn, Victoria, Australia (3104), and Willy Braun, 39 Glencairn Ave., Brighton, Victoria, Australia (3187)

Filed Dec. 1, 1980, Ser. No. 211,942
Claims priority, application Australia, Dec. 7, 1979, PE1643
Int. Cl.³ C12P *33/04*
U.S. Cl. 523—502 **6 Claims**

1. A process of preparing an aqueous slurry of vesiculated granules of crosslinked polyester resin which granules have a maximum shrinkage on drying of 5% of the granule diameter, the process comprising the steps of

(a) emulsifying water into a solution in essentially water-insoluble α, β-ethylenically unsaturated monomer of a carboxylated unsaturated polyester resin, in the presence of a base, to give a stable emulsion of water in polyester solution;
(b) dispersing this emulsion into water containing a stabilizer for the resulting droplets of emulsion; and
(c) initiating addition polymerization within the droplets to convert them to crosslinked vesiculated polyester resin;

characterized in that

(i) the acid value of the polyester is from 5–50 mg KOH/g;
(ii) the base is a metal oxide, hydroxide or salt wherein the metal cation is chosen from the group consisting of cal-

cium, magnesium, barium, titanium, zinc, lead, strontium and cobalt and, where a metal salt is used, the pKa value of the conjugate acid of the anion is greater than 2; and

(iii) the base is present to the extent of from 0.3 equivalents of metal cation per equivalent of polyester carboxyl group to that quantity required for the complete neutralization of all the carboxyl groups.

4,321,333
POLYURETHANE PREPARED FROM POLYISOCYANATE BLEND

Louis M. Alberino, Cheshire, and Robert J. Lockwood, North Branford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 16, 1981, Ser. No. 254,920
Int. Cl.³ C08G *18/32, 18/10*
U.S. Cl. 521—159 **27 Claims**

1. In a polyurethane polymer comprising the reaction product of an organic polyisocyanate (A), an organic polyol (B), and a difunctional extender (C) wherein the equivalent proportions of said polyol (B) to said extender (C) is within the range of about 1:4 to about 1:40 and the ratio of isocyanate equivalents of (A) to the total active hydrogen equivalents of said (B) and said (C) is from about 0.95 to about 1.10, wherein the improvement comprises employing as the polyisocyanate (A) a composition comprising a blend of,

(a) from about 10 to about 50 percent by weight of a liquid isocyanate terminated prepolymer having an isocyanate equivalent weight of from about 150 to about 600 and comprising the reaction product of methylenebis(phenyl isocyanate) with a polyol mixture comprising:

(1) from about 15 to about 70 percent by weight of a polyol having a functionality of from about 2 to about 3 and a molecular weight of at least 1000; and

(2) from about 85 to about 30 percent by weight of a polyol having a molecular weight falling within a range of from about 115 to about 300 selected from the group consisting of a diol, a triol, and mixtures thereof,

wherein the total hydroxyl equivalents of said (1) and said (2) fall within a range of from about 0.10 to about 0.65 equivalent per equivalent of said methylenebis(phenyl isocyanate); and

(b) from about 90 to about 50 percent by weight of a liquefied methylenebis(phenyl isocyanate), provided the proportions of said prepolymer (a) and said liquefied methylenebis(phenyl isocyanate) (b) while falling within the ranges set forth above are such that the isocyanate equivalent weight of said blend is from about 145 to about 200.

4,321,334
MELT CRYSTALLIZATION OF BUTENE-1 POLYMERS

Ananda M. Chatterjee, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 4, 1980, Ser. No. 183,869
Int. Cl.³ C08K *3/04*
U.S. Cl. 524—579 **7 Claims**

1. A crystallizable thermoplastic composition which comprises an isotactic butene-1 homopolymer and about 0.05 to 0.45% by weight of substantially graphitic non-turbostratic carbon.

4,321,335
POWDER COATING RESIN COMPOSITION

Shunji Arimoto, Izumiohtsu; Akio Shoji, Kishiwada; Shoichiro Takezawa, Sakai; Noboru Ishikawa, and Hirofumi Takeda, both of Izumiohtsu, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,376
Claims priority, application Japan, Jun. 19, 1979, 54-76346; Sep. 26, 1979, 54-122544
Int. Cl.³ C08L *63/00, 37/00, 75/04*
U.S. Cl. 525—116 **10 Claims**

1. A powder coating resin composition comprising

(A) 97 to 70% by weight of a phosphorus-containing vinyl polymer containing a glycidyl group and having a softening point, determined by the ring and ball method, of 70° to 150° C. and a number average molecular weight of 1500 to 30,000, and

(B) 3 to 30% by weight of a curing agent, wherein said phosphorus-containing vinyl polymer (A) is the reaction product of (i) a vinyl monomer having at least one curable glycidyl functional group, (ii) a phosphorus-containing vinyl monomer selected from the group consisting of phosphoxy-alkyl methacrylates, phosphoxyalkyl acrylates, dialkyl phosphate alkylmethacrylates, dialkyl phosphate alkylacrylates, dialkyl phosphite alkylmethacrylates, and dialkyl phosphite alkylacrylates; and (iii) another vinyl monomer.

4,321,336
HIGH IMPACT POLYAMIDE BLENDS

Rolf-Volker Meyer; Rolf Dhein, and Friedrich Fahnler, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 928,593, Jul. 27, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,524
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1977, 2734693
Int. Cl.³ C08L *23/06, 23/08, 77/00, 83/04*
U.S. Cl. 525—183 **13 Claims**

1. A high impact polyamide blend consisting of

(1) from 60 to 95% by weight of a polyamide having a relative viscosity of at least 3.5 determined on a 1% solution of the polyamide in m-cresol at 25° C. and

(2) from 5 to 40% by weight of at least one polymer selected from the group consisting of

(a) aliphatic polyolefin having 2 to 4 carbon atoms in the olefin moiety

(b) olefinic copolymer composed of

(i) from 65 to 98% by weight of an aliphatic C_2 to C_4 monoolefin and

(ii) from 35 to 2% by weight of (meth)acrylic acid or of a (meth)acrylic acid ester having 2 to 10 carbon atoms in the alcohol portion of the ester

(c) copolymers of

(I) from 50 to 75% by weight of styrene,

(II) from 5 to 15% by weight of (meth)acrylic acid and

(III) from 20 to 30% by weight of a (meth)acrylic acid ester;

(d) polymers of from 70 to 100% by weight of C_4 to C_5 aliphatic dienes and from 0 to 30% by weight of acrylonitrile and

(e) a polydimethyl siloxane having a molecular weight of at least 10,000 with the provisos that the sum of (1)+(2) is equal to 100% by weight of the high impact polyamide blend, that the sum of (i)+(ii) is equal to 100% by weight of (b), that the sum of (I) to (III) is equal to 100% by weight of (c), that the sum of (a) to (e) is equal to 100% by weight of (2) and that component (2a) is invariably used either with component (2b) or (2c).

4,321,337
IONIC HYDROCARBON POLYMERS HAVING IMPROVED ADHESION TO NYLON

Malcolm S. Smith, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 11, 1980, Ser. No. 106,383
Int. Cl.³ C08F *8/42*
U.S. Cl. 525—329 **12 Claims**

1. Improved ionic copolymers of α-olefins having the for-

mula R—CH=CH_2, where R is a radical selected from the group consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and α,β-ethylenically unsaturated monocarboxylic acids having from 3 to 8 carbon atoms, said copolymers having from about 10% to about 90% of the carboxylic acid groups ionized by neutralization with zinc ions uniformly distributed throughout the copolymer, said copolymer being a direct copolymer of the α-olefins and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which (1) the α-olefin content of the copolymer is at least 80 mol percent, based on the α-olefin-acid copolymer, (2) the unsaturated carboxylic acid content of the copolymer is from about 1 to about 10 mol percent, based on the α-olefin-acid copolymer, and (3) any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated, said ionic copolymers having solid state properties characteristic of crosslinked polymer and melt-fabricability properties characteristic of uncrosslinked, thermoplastic polymers, the improvement comprising carrying out said neutralization such that the resultant ionic copolymer has a zinc salt content of from about 0.0115 to about 0.0229 mols per 100 g of ionic copolymer, said ionic copolymers having improved adhesion to nylon.

4,321,338

NOVEL CHLORINATED POLYMER AND COATING COMPOSITION EMPLOYING THE SAME

Kazuo Shimizu, and Toru Morita, both of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 209,276
Claims priority, application Japan, Nov. 28, 1979, 54/153909
Int. Cl.³ C08F *8/22*
U.S. Cl. 525—335 **8 Claims**

1. A chlorinated polymer which is characterized by being essentially a chlorinated polymethylpentene obtained by uniformly chlorinating an isotactic poly-4-methylpentene-1 having the melt index of 8–70 g/10 min. at a condition of 260° C. and 5 Kg (ASTM D 1238-65T) to chlorine content of not less than 50 weight % in condition of solution thereof.

4,321,339

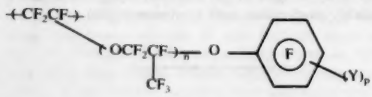
FLUORINATED PHENOXYPROPYL VINYL ETHER POLYMER

Burton C. Anderson, Wilmington, Del., and Ronald E. Uschold, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 89,374, Oct. 30, 1979, Pat. No. 4,288,574. This application Mar. 18, 1981, Ser. No. 244,886
Int. Cl.³ C08F *12/16*
U.S. Cl. 525—343 **3 Claims**

1. Process comprising contacting and reacting the polymer having recurring units of

(1) $+CF_2CFX+$ wherein X in each of the recurring units is independently selected from F, Cl, R and OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms and

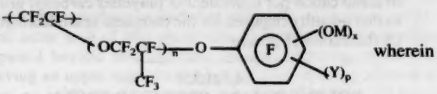


wherein

Y is Cl, R or OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms; n is 1, 2 or 3; and p is 0 or 1,

said polymer having 0 to 21 units of (1) per unit of (3), with a hydrolytic solution comprising about 8 to about 25 wt. % of an alkali metal hydroxide, about 30 to 70 wt. % of water, and the remainder, to total 100 wt. %, an organic liquid penetrant, at a temperature of about 80°C to about 160°C, and recovering fluorinated polymer consisting essentially of

(1) $+CF_2CFX+$ wherein X in each of the recurring units is independently selected from F, Cl, R and OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms and



wherein

Y is Cl, R or OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms; M is H, alkali metal or NR'_4 wherein R′ in each of the recurring units is independently selected from H and alkyl of 1 to 6 carbon atoms; x is an average value within the range about 0.2 to about 1.0; n is 1, 2 or 3; and p is 0 or 1,

said polymer having 0 to about 21 units of (1) per unit 35 of (2).

4,321,340

PROCESS FOR FORMING A POWDERED SULFONATED EPDM TERPOLYMER (C-951)

Robert R. Klein, Berkeley Heights, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

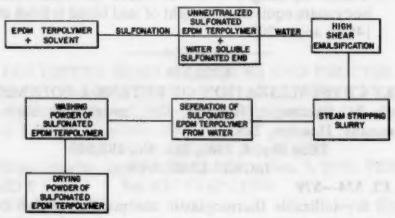
Filed Apr. 1, 1980, Ser. No. 136,365
Int. Cl.³ C08F *8/36*; C08C *19/20*
U.S. Cl. 525—344 **8 Claims**

1. A process for forming a sulfonated EPDM terpolymer having less than 1.25 wt. % of a sulfonated derivative of monomeric 5-ethylidene-2-norbornene therein, which comprises the steps of:

(a) contacting a terminated cement of an EPDM terpolymer having a monomeric ENB therein dissolved in a hydrocarbon solvent with a sulfonating agent to form an unneutralized sulfonated EPDM terpolymer and a water soluble sulfonated derivative of said monomeric 5-ethylidene-2-norbornene;

(b) adding water to said cement, which causes the viscosity of said cement to increase or a gel to form, a volume ratio of said water to said cement being about 60/1 to about 2/1;

(c) emulsifying under high shear the blend of said water and said cement to form a slurry of particles of said sulfonated EPDM terpolymer in said water, wherein said water



soluble sulfonated derivative of said 5-ethylidene-2-norbornene is solubilized in said water;

(d) steam stripping said slurry under high speed agitation thereby forming said solvent from said slurry;

(e) separating said particles of said powder of said sulfonated EPDM terpolymer from said water;

(f) washing said powder of said sulfonated EPDM terpolymer with water thereby further removing said water soluble sulfonated derivative of said monomeric 5-ethylidene-2-norbornene from said sulfonated EPDM terpolymer; and

(g) drying said particles of said powder of said sulfonated EPDM terpolymer, said particles have a particle size of about 500 to about 3,000 microns.

4,321,341
THERMOPLASTIC SEGMENTED ELASTOMERIC COPOLYETHER-ESTERS AND THEIR USE AS PRESSURE-SENSITIVE ADHESIVES

Rainer Neuberg, Dannstadt-Schauernheim; Hans G. Matthies, Ludwigshafen, and Wolfgang Druschke, Dirmstein, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

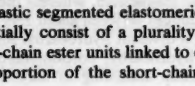
Filed Jun. 6, 1980, Ser. No. 157,013

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925582

Int. Cl.³ C08G *63/76*

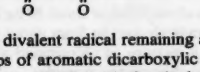
U.S. Cl. 525—437 **9 Claims**

1. Thermoplastic segmented elastomeric copolyether-esters which substantially consist of a plurality of recurring short-chain and long-chain ester units linked to one another by ester bonds, the proportion of the short-chain ester units of the formula



I

where R is the divalent radical remaining after removal of the carboxyl groups of aromatic dicarboxylic acids having a molecular weight of <350 and A is the divalent radical remaining after removal of the hydroxyl groups of a diol having a molecular weight of <250, being from 15 to 75% by weight, and the proportion of the long-chain ester units of the formula



II

where R is defined as above and B is the divalent radical remaining after removal of the terminal hydroxyl groups from a long-chain glycol, being from 25 to 85% by weight of the copolyester, and which contain from 0.01 to 5 mole%, based on copolyester, of trifunctional or more highly functional compounds, serving as branching agents, chemically condensed into the polymer molecule.

4,321,342
CURABLE FIXTURES OF POLYEPOXIDES AND AMINE-TERMINATED GRAFT POLYMER DISPERSIONS

John E. Davis, Woodhaven, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 27, 1981, Ser. No. 238,756

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—530 **9 Claims**

1. A curable composition which comprises (a) a polyepoxide compound and (b) a graft polymer dispersion prepared by the in situ polymerization in the presence of an effective amount of a free radical initiator, an ethylenically unsaturated monomer or mixture of monomers in an amine-terminated polyoxyalkylene polyether polymer.

4,321,343
POLYISOBUTYLENE/PHENOL POLYMERS TREATED WITH DIISOCYANATES AND POLY(OXYALKYLENE)POLYOLS

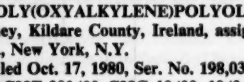
John M. Rooney, Kildare County, Ireland, assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 17, 1980, Ser. No. 198,038

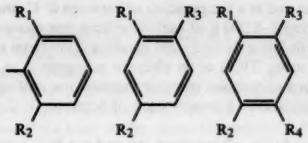
Int. Cl.³ C08F *283/00*; C08G *18/22, 18/24, 18/63*

U.S. Cl. 525—534 **16 Claims**

1. A block copolymer having the general structure



wherein A consists essentially of polyisobutylene segment; R is



and R_1, R_2, R_3 and R_4 are independently selected from lower alkyl groups having from 1 to 4 carbon atoms and the total of R_1 and R_2 is from 2 to 10 carbons; R_5 is a divalent aliphatic, aromatic, cycloaliphatic or cycloalkylene group of 1 to 36 carbons; and B is a polyalkylene polyol segment.

4,321,344
CONTINUOUS BULK POLYMERIZATION OF THERMOPLASTIC RESINS

Tomoaki Sumitani; Yasunori Masaki; Tokinobu Furukawa; Yukio Inoue, and Chikao Oda, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1980, Ser. No. 202,326

Claims priority, application Japan, Nov. 2, 1979, 54-141348

Int. Cl.³ C08F *2/02*

U.S. Cl. 526—64 **5 Claims**

1. A method for conducting continuous bulk polymerization of a thermoplastic resin which comprises:

using a horizontal continuous polymerizer comprising a cylindrical body, one or more shafts having a plurality of stirring elements and disposed in said body, a material inlet provided at an end of said body, a material drawing means and an outlet provided at the other end of said body,

introducing an intermediate polymerization product of an unsaturated monomer capable of producing resin by bulk polymerization into said material inlet,

controlling the pressure in the polymerizer at a prescribed level, and evaporating unsaturated monomer from a polymerization solution in said polymerizer under said pressure conditions, and

spraying a controlled amount of unsaturated monomer from a plurality of monomer spray nozzles provided along the longitudinal direction of the polymerizer onto a surface of polymerization solution therein and evaporating said monomer,

whereby the polymerization is carried out at a constant prescribed temperature by removing the heat of polymerization reaction and heat of stirring by means of the latent heat of evaporation of the monomer evaporated and the sensible heat and the latent heat of evaporation of the monomer sprayed from said spray nozzles.

4,321,345
METHOD FOR PRODUCING α-OLEFIN POLYMERS

Akihiro Sato, Chibaken; Masami Tachibana, and Kazutsune Kikuta, both of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 15, 1979, Ser. No. 21,570

Claims priority, application Japan, Aug. 31, 1978, 53-106797

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—115 **15 Claims**

1. In the method for producing α-olefin polymers by polymerizing α-olefins in the presence of a catalyst, said catalyst being obtained by

(a) reacting one mol of a trivalent metal halide with 0.1–20 mols of a divalent metal compound to produce a solid product (I), said reaction being carried out by milling and heating at a temperature between room temperature and 500° C.,

(b) reacting 1–5,000 g of *each of* at least one electron donor with 100 g of said solid product (I) in from one to ten steps in a suspension reaction manner or a milling reaction

manner and at a temperature of between 0° C. and 500° C.,

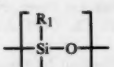
(c) reacting 1–5,000 g of *each of* at least one electron acceptor with 100 g of said solid product (I) in from one to ten steps, using $TiCl_4$ as an electron acceptor in at least one step, in a suspension reaction manner or a milling reaction manner, and at a temperature of between 0° C. and 500° C.,

these two kinds of reactions (b) and (c) being carried out separately or simultaneously together to thereby form a solid product (II),

(d) combining 100 g of said solid product with 50–5000 g of a trialkylaluminum and 2–2,000 g of an electron donor, said trivalent metal halide being selected from the group consisting of anhydrous $AlCl_3$ and anhydrous $FeCl_3$,

said divalent metal compound being selected from the group consisting of $Mg(OH)_2$, $MgCO_3$, MgO, $MgAl_2O_4$, $MgCO_3.Mg(OH)_2.3H_2O$ and $Mg_6Al_2(OH)_{16}CO_3.4H_2O$,

said at least one electron donor being selected from the group consisting of compounds having the general formula RCOOR′, ROH, ROR′ or polysiloxanes characterized by the formula



(wherein n=3 to 10,000 R_1 and R_2 represent the same or different substituents capable of connecting with silicon) and wherein in all of the foregoing formulas R and R′ are each, one hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms,

said at least one electron acceptor being $TiCl_4$ or $TiCl_4$ and $SiCl_4$.

4,321,346

TITANIUM TRICHLORIDE CATALYST AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Ueno, Namekawa; Naomi Inaba, Ooi; Tukuo Makishima, Kawagoe; Koh Watanabe, Kunitachi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 10670, Feb. 9, 1979, Pat. No. 4,182,691, which is a continuation-in-part of Ser. No. 774,964, Mar. 7, 1977, abandoned. This application Jul. 20, 1979, Ser. No. 111,171

Claims priority, application Japan, Mar. 8, 1976, 51-24121

Int. Cl.³ C08F *4/64, 10/06*

U.S. Cl. 526—142 **16 Claims**

1. A process for the stereoregular polymerization of α-olefins which comprises contacting under α-olefin polymerization conditions and α-olefin with a catalyst system comprising an organometal compound co-catalyst and a titanium trichloride catalyst, said titanium trichloride produced by:

(i) reducing titanium tetrachloride with an organometal compound of the formula R_nAlX_{3-n}, wherein R is an alkyl or aryl group having from 1 to 18 carbon atoms, X is a halogen, and n is a numeral in the range of $1 \leqq n \leqq 3$ at a temperature of from about −50° C. to about +30° C. to produce a reduced solids product;

(ii) contacting said reduced solids product with a chlorinated saturated hydrocarbon having 2 carbon atoms in the presence of a complexing agent selected from aliphatic ethers having 4 to 16 carbon atoms at a temperature of from about 60° C. to about 100° C. for about 1 to 10 hours thereby producing a titanium trichloride catalyst component containing titanium trichloride of the deltatype; and

(iii) recovering the resulting titanium trichloride catalyst component.

4,321,347

PROCESS FOR THE POLYMERIZATION OF OLEFINS

David L. Beach, Gibsonia, Pa., and Adolfo Zambelli, Milan, Italy, assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 220,447

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—151 **72 Claims**

1. A process for polymerizing alpha olefins to obtain highly crystalline polymers which comprises subjecting an alpha olefin to polymerization conditions using as a catalyst therefor the reaction product of (A) an aluminum hydrocarbyl treated with an electron donor compound and (B) a support containing chlorine, bromine and magnesium, wherein the molar ratio of bromine to chlorine ranges between about 1:99 to about 50:50, obtained by reacting a divalent hydrocarbyl magnesium compound wherein the hydrocarbyl portion thereof is a radical selected from the group consisting of alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about one to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, and aralkyl and alkaryl radicals having from about six to about 40 carbon atoms with a mixture of chlorinated and brominated aluminum compounds having the formula:

$$Al(R^3R^4R^5)_{(3-a)}X_a$$

wherein each of R^3, R^4, and R^5 is a hydrocarbyl radical selected from the group consisting of alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about one to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, and aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, X is chlorine or bromine and a is an integer from 1 to 3, said support having been additionally treated with an electron donor compound and with titanium tetrachloride.

4,321,348

COPOLYMERS OF N-VINYL PYRROLIDONE AND A VINYLIC, ALLYLIC OR METHALLYLIC ESTER OF A CYCLIC α- OR β-CARBOXYLIC ACID; AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Bernard Jacquet, Antony; Christos Papantoniou, Montmorency; Guy Vanlerberghe, Montjay La Tour, and Jean Mondet, Sevran, all of France, assignors to L'Oreal, Paris, France

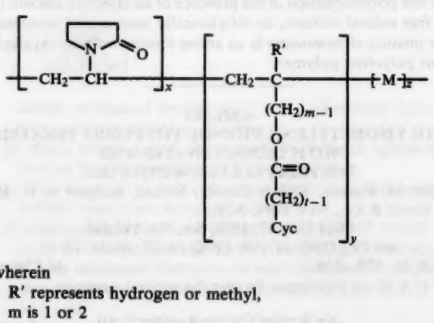
Filed Feb. 4, 1980, Ser. No. 118,634

Claims priority, application France, Feb. 8, 1979, 79 03261

Int. Cl.³ C08F *220/12, 226/10*

U.S. Cl. 526—218 **8 Claims**

1. A copolymer consisting of units of the formula



wherein

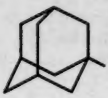
R′ represents hydrogen or methyl,

m is 1 or 2

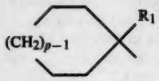
t is 1 or 2,

when t=1, Cyc represents

(i) a radical of the formula

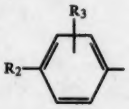


(ii) a radical of the formula,



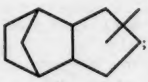
wherein R_1 represents hydrogen or methyl, ethyl, and p is 1 or 2,

(iii) a radical of the formula

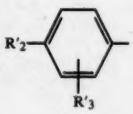


wherein R_2 represents hydrogen, methyl, tert. butyl, ethoxy, butoxy or dodecoxy, and R_3 represents hydrogen, alkyl having 1–4 carbon atoms or alkoxy having 1–4 carbon atoms, or

(iv) a radical of the formula,



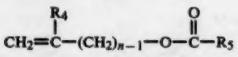
and when t=2, Cyc represents a radical of the formula,



wherein R'_2 and R'_3 have the same meanings as those for R_2 and R_3, respectively,

M is a unit derived from a monomer selected from the group consisting of

(i') a monomer having the formula



wherein n is 1 or 2, R_4 represents hydrogen or methyl and R_5 represents linear or branched alkyl having 1–21 carbon atoms,

(ii') a monomer having the formula, $CH_2{=}CH{-}OR_6$ wherein R_6 in linear or branched alkyl having 6–18 carbon atoms, and

(iii') a monomer having the formula, $CH_2{=}CH{-}(CH_2)_s{-}CH_3$, wherein s is a whole number from 3 to 15,

x represents from 20 to 90 weight percent,

y represents from 10 to 80 weight percent, and z represents from 0 to 70 weight percent, with the proviso that the total sum of non-homopolymerizable monomers does not exceed 50 mole percent of the total monomers in said copolymer.

4,321,349

ACCELERATOR FOR CURABLE COMPOSITIONS

Richard D. Rich, Avon, Conn., assignor to Loctite Corporation, Newington, Conn.

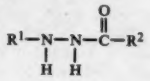
Division of Ser. No. 580,267, May 23, 1975, Pat. No. 4,287,330. This application May 27, 1980, Ser. No. 153,473

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

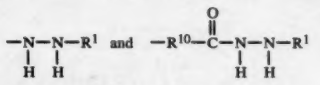
Int. Cl.³ C08F *24/00, 18/20, 26/02*

U.S. Cl. 526—270 **16 Claims**

1. A curable adhesive and sealant composition comprising a room temperature polymerizable acrylate ester, a free radical initiator in an amount sufficient to initiate polymerization of said ester and, as a polymerization accelerator, a compound having the formula



wherein R^1 is selected from the group consisting of alkyl from ethyl to 6 carbon atoms, cycloalkyl, aryl, alkenyl, cycloalkenyl and R^2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, aryloxy, carbonyl, amino, and the following groups:



wherein R^{10} is selected from the group consisting of alkyl groups containing one to about 10 carbon atoms, alkenyl groups containing two to about 10 carbon atoms, and aryl groups containing up to about 10 carbon atoms, said accelerator being present in an amount sufficient to accelerate the polymerization at room temperature.

4,321,350

PROCESS FOR THE CATALYTIC SETTING OF POLYURETHANE MOLDING COMPOSITIONS

Hans-Dieter Lehmann, Waltenhofen, Fed. Rep. of Germany, assignor to Gambro Dialysatoren KG, Fed. Rep. of Germany

PCT No. PCT/EP78/00006, § 371 Date May 20, 1979, § 102(e) Date Apr. 30, 1979, PCT Pub. No. WO79/00154, PCT Pub. Date Apr. 5, 1979

PCT Filed Aug. 7, 1978, Ser. No. 198,110

Claims priority, application Sweden, Apr. 30, 1979, 7710502

Int. Cl.³ C08G *18/22, 18/16*

U.S. Cl. 528—48 **13 Claims**

1. A catalytically-set polyurethane molding composition substantially free from foam and containing as a catalyst setting agent a physiologically acceptable carboxylic acid selected from the group consisting of sorbic acid, parasorbic acid, cinnamic acid and mixtures thereof.

6. A process comprising reacting polyisocyanate with polyol or polyurethane prepolymers having isocyanate or hydroxyl groups in the presence of a catalytically effective amount of at least one physiologically safe carboxylic acid selected from the group consisting of sorbic acid, parasorbic acid and cinnamic acid.

4,321,351

PROCESS FOR THE PRODUCTION OF EPOXY RESIN CASTINGS

Paul Zuppinger, Arlesheim, and Dieter Baumann, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,705

Claims priority, application Switzerland, Nov. 5, 1979, 9907/79

Int. Cl.³ G08G *59/42*

U.S. Cl. 528—91 **13 Claims**

1. A process for the production of epoxy resin castings by

reaction of a liquid polyfunctional epoxy compound, a carboxylic anhydride, optionally a carboxylic acid and/or a carboxylic acid ester, a boron trifluoride complex compound, water, a cyclic ether, and one or more compounds (X) which contain at least two OH groups or at least two COOH groups, or together contain at least one OH group and one COOH group, said compounds (X) being selected from the group consisting of aliphatic glycols, polyesters and polyethers with terminal OH groups, polyesters with terminal COOH groups, and hemiesters of dicarboxylic anhydrides which carry the anhydride group at a carbocyclic ring, with polyols, which process comprises the use of a zinc fluoroborate complex compound as boron trifluoride complex compound and tetrahydropyrane as cyclic ether, the ratio of the ingredients employed in the reaction being such that the mixture contains, per 100 parts by weight of epoxy compound, more than 10 parts by weight, preferably 50 parts by weight, of the sum of carboxylic anhydride, optionally carboxylic acid and/or carboxylic acid ester, zinc fluoroborate complex compound, water, tetrahydropyrane and compound (X), and, per 1 epoxide equivalent, 0.01 to 1.0 mole of water, 0.02 to 0.2 mole of tetrahydropyrane, 0.5 to 1.8 acid equivalents, and 0.5 to 2.5 g of BF_3 of the zinc fluoroborate complex compound, with the proviso that, when calculating the carboxylic acid equivalents, carboxylic anhydride and carboxylic acid ester are counted as carboxylic acid.

4,321,352

PROCESS FOR PRODUCTION OF METAL-CONTAINING IONIC CURED RUBBERS

Hideaki Matsuda, Marugame, Japan, assignor to Okura Kogyo Kabushiki Kaisha, Japan

Filed Sep. 29, 1980, Ser. No. 191,688
Claims priority, application Japan, Oct. 8, 1979, 54/128887
Int. Cl.³ C08C *19/36*
U.S. Cl. 528—115 **7 Claims**

1. A process for producing a novel metal-containing cured rubber having ionic bonds; which comprises reacting a partially neutralized liquid rubber which has been prepared by partial neutralization, with metal ion, of a liquid rubber selected from the group consisting of a carboxyl-terminated liquid polybutadiene, a carboxyl-terminated butadiene-acrylonitrile copolymer, the above mentioned polymer or copolymer having additional carboxyl group on its side chain and mixtures thereof, with a bisepoxide and a dibasic acid anhydride.

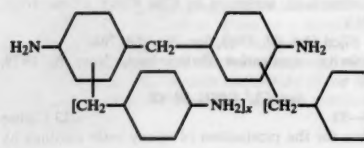
4,321,353

POLYCYCLOALIPHATIC POLYAMINES

Edward W. Kluger, Pauline, and Tien K. Su, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 850,502, Nov. 10, 1977, Pat. No. 4,226,737. This application May 27, 1980, Ser. No. 153,645
Int. Cl.³ C08G *59/50*
U.S. Cl. 528—120 **3 Claims**

1. A method for improving the resinifying properties of epoxy curing agents which comprises incorporating into the epoxy curing agent, prior to admixing same with a polyepoxide resin, from about 5 to about 90 weight percent of a polycycloaliphatic polyamine having the general structure



wherein x and y are integers of from 0 to about 2 and the sum of the integers, x+y, is at least 1.

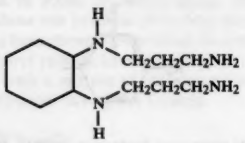
4,321,354

POLYAMINE SUBSTITUTED CYCLOALIPHATIC COMPOUNDS

Edward W. Kluger, Pauline; Tien-Kuei Su, and Teresa J. Thompson, both of Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 925,009, Jul. 17, 1978, abandoned, which is a division of Ser. No. 850,460, Nov. 10, 1977, abandoned. This application Sep. 2, 1980, Ser. No. 183,405
Int. Cl.³ C08G *59/50*
U.S. Cl. 528—122 **7 Claims**

1. An epoxy resin composition comprising an epoxy resin and an epoxy resin curing agent wherein the epoxy resin curing agent is a compound having the formula:



4,321,355

PROCESS FOR PREPARING POLYARYLATES

Louis M. Maresca, Belle Mead; Markus Matzner, Edison, and Benito See, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 23, 1980, Ser. No. 189,561
Int. Cl.³ C08E *63/02*
U.S. Cl. 528—180 **27 Claims**

1. An improved process for preparing a polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/g which process comprises the following steps:

(a) reacting an acid anhydride derived from an acid containing from 2 to 8 carbon atoms with at least one dihydric phenol to form the corresponding diester; and

(b) reacting said diester with at least one aromatic dicarboxylic acid at a temperature sufficient to form the polyarylate, wherein the improvement comprises removing residual acid anhydride, after formation of the dihydric phenol diester, so that its concentration is less than about 1500 parts per million.

4,321,356

TRANSESTERIFICATION PROCESS UTILIZING AS A REACTANT BIS(ORTHO-HALOARYL)CARBONATES

Daniel J. Brunelle, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,349
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—200 **10 Claims**

1. A polycarbonate transesterification process comprising reacting a bis(ortho-haloaryl)carbonate and a dihydric phenol under transesterification reaction conditions in the presence of a metal hydride catalyst.

4,321,357

INJECTION MOLDABLE AMIDE-IMIDE POLYMERS CONTAINING DIVALENT ALIPHATIC RADICALS DERIVED FROM ALIPHATIC DIAMINES

Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 16, 1980, Ser. No. 112,650
Int. Cl.³ C08G *69/26*
U.S. Cl. 528—350 **11 Claims**

1. A process for the preparation of ordered linear crystalline

injection moldable polyamide-imide polymers which process comprises reacting fully acylated aliphatic, cycloaliphatic or araliphatic diamines with tricarboxylic acid anhydrides compounds and aliphatic, cycloaliphatic or araliphatic diamines in a molar ratio of about 1:2:1 at a temperature of about 400 to 700 Fahrenheit.

4,321,358

WATER TERMINATION OF POLY(ARYLENE SULFIDE) CURING

Robert P. Zelinski, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1980, Ser. No. 212,186
Int. Cl.³ C08G *75/14*
U.S. Cl. 528—388 7 Claims

1. A process for pre-curing particulate poly(arylene sulfide) resin comprising:

(a) heating the resin particles in a vessel in contact with an oxygen-containing atmosphere to a temperature in the range of about 10° to about 70° C. below the melt point of the resin for a time sufficient to effect the pre-cure,

(b) terminating the heating, and

(c) contacting the pre-cured particles with water of sufficient volume and for a sufficient time to reduce the temperature level below the level at which curing occurs.

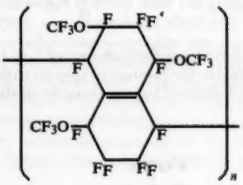
4,321,359

PERFLUOROCOMPOUNDS

Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1980, Ser. No. 182,562
Int. Cl.³ C08G *61/02*
U.S. Cl. 528—397 4 Claims

1. As a compound, the homopolymer having the formula



wherein n is an integer of from 2 to 20.

4,321,360

PRODUCTION OF CARBOHYDRATES

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 149,178, May 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 13,139, Feb. 21, 1979, Pat. No. 4,226,982. This application May 21, 1981, Ser. No. 265,701
The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.
Int. Cl.³ C08B *15/00*
U.S. Cl. 536—1 4 Claims

1. The process for the production of carbohydrates by the following steps:

(a) mixing 2 parts by weight of a cellulose-containing plant with 1 to 3 parts by weight of a melted alkali metal hydroxide, then

(b) agitating the mixture at 150° C. to 220° C. for 5 to 60 minutes, thereby

(c) producing a water-soluble broken-down alkali cellulose polymer, then

(d) adding a salt-forming compound in an aqueous solution until the pH is 5 to 6.5, thereby producing a non-water-soluble lignin-cellulose polymer, carbon dioxide and an aqueous solution of carbohydrates and salt, then

(e) filtering off the lignin-cellulose polymer and recovering the aqueous solution of carbohydrates and salt.

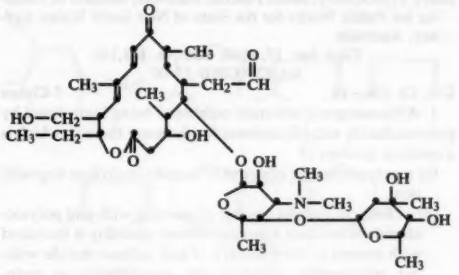
4,321,361

DEMYCINOSYLTYLOSIN AND PROCESS FOR ITS PRODUCTION

Richard H. Baltz; Gene M. Wild, both of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 12, 1980, Ser. No. 156,854
Int. Cl.³ A61K *31/71*; C07H *17/08*
U.S. Cl. 536—17 R 15 Claims

1. A compound selected from the group consisting of (1) 23-demycinosyltylosin which has the structure:



and (2) the acid addition salts of 23-demycinosyltylosin.

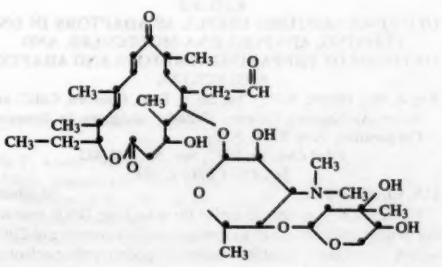
4,321,362

DE(MYCINOSYLOXY)TYLOSIN AND PROCESS FOR ITS PRODUCTION

Richard H. Baltz; Gene M. Wild, both of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 12, 1980, Ser. No. 156,855
Int. Cl.³ A61K *31/71*; C07H *17/08*
U.S. Cl. 536—17 R 15 Claims

1. A compound selected from the group consisting of (1) 23-de(mycinosyloxy)tylosin which has the structure:



and (2) the acid addition salts of 23-de(mycinosyloxy)-tylosin.

4,321,363

ADSORBENT FOR UROKINASE CONTAINING AGAROSE

Daigaku Takiguchi, Tokyo; Eiji Itou, Odawara; Hiroaki Nakamura, Kawasaki, and Izumi Kumita, Kanagawa, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Feb. 21, 1980, Ser. No. 123,307
Int. Cl.³ C07H 5/06
U.S. Cl. 536—18 2 Claims

1. An adsorbent for urokinase consisting of a carrier, a spacer and a ligand wherein the carrier is agarose, the spacer is $NH_2(CH_2)_6NHCOCH_2CH_2COOH$ and the ligand is 2,5-diaminobenzthiazole.

4,321,364

PREPARATION OF SOLUBLE CHROMOGENIC SUBSTRATES

Barry V. McCleary, South Penrith, Australia, assignor to Minister for Public Works for the State of New South Wales, Sydney, Australia

Filed Apr. 17, 1980, Ser. No. 141,149
Int. Cl.³ C08B 37/00
U.S. Cl. 536—18 7 Claims

1. A chromogenic substrate capable of being hydrolyzed by polysaccharide endo-hydrolases for the assay thereof, which is a reaction product of

(a) a polysaccharide susceptible to endo-hydrolase degradation;

(b) a chemical reagent capable of reacting with said polysaccharide to produce a product whose solubility is increased with respect to the solubility of said polysaccharide without substantially reducing the susceptibility to endo-hydrolase degradation; and

(c) a dye substance capable of reacting with said polysaccharide to produce a water soluble dyed coloured product; the reaction of the polysaccharide with said chemical having been carried out with an amount of said chemical reagent such as to produce a degree of chemical substitution of the polysaccharide in the range 0.06 to 0.6 degrees of substitution.

3. A chromogenic substrate according to claim 1, wherein said chemical reagent is capable of effecting on the polysaccharide a chemical reaction selected from carboxymethylation, hydroxypropylation, hydroxyethylation, quaternisation, sulphation, phosphation, and nitration.

4,321,365

OLIGONUCLEOTIDES USEFUL AS ADAPTORS IN DNA CLONING, ADAPTED DNA MOLECULES, AND METHODS OF PREPARING ADAPTORS AND ADAPTED MOLECULES

Ray J. Wu, Ithaca, N.Y.; Chander P. Bahl, Concord, Calif., and Saran A. Narang, Ottawa, Canada, assignors to Research Corporation, New York, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,422
Int. Cl.³ C07H 21/04
U.S. Cl. 536—27 19 Claims

1. An adaptor molecule useful for attaching DNA containing genetic information to a cloning vehicle consisting of DNA which comprises a double-stranded oligodeoxyribonucleotide having at one end thereof a protruding nucleotide sequence which is the recognition site for a restriction endonuclease.

4,321,366

PROCESS OF PREPARING 2-AZIDO-2-DEOXYARABINOFURANOSYL HALIDES

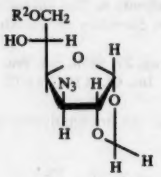
Miroslav V. Bobek, Williamsville; Alexander Bloch, Athol Springs, and Yung-Chi Cheng, Buffalo, all of N.Y., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 905,529, May 12, 1978, Pat. No. 4,230,698.
This application Jun. 3, 1980, Ser. No. 156,202
Int. Cl.³ C07H 5/02, 5/04
U.S. Cl. 536—55 16 Claims

1. The process of preparing a 2-azido-2-deoxyarabinofuranosyl chloride of the formula

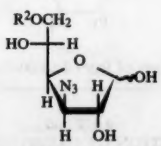
wherein each of R^2 and R^3 is hydrocarbylcarbonyl of 2 to 12 carbon atoms, comprising the steps of

(a) acylating 1,2-O-isopropylidene-3-azido-3-deoxy-α-D-glucofuranose to obtain 1,2-O-isopropylidene-6-O-acyl-3-azido-3-deoxy-α-D-glucofuranose of the formula

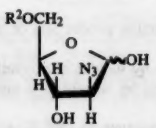


wherein R^2 is hydrocarbylcarbonyl of 2 to 12 carbon atoms,

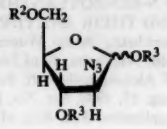
(b) hydrolyzing the product of step (a) to obtain 66-O-acyl-3-azido-3-deoxy-D-glucofuranose of the formula



(c) oxidizing the product of step (b), through the use of sodium or potassium metaperiodate as ıoxidizing agent, and hydrolyzing the resultant product to obtain 5-O-acyl-2-azido-2-deoxy-D-arabinofuranose of the formula

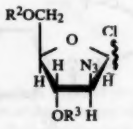


(d) acylting the product of step (c) to obtain 1,3-di-O-acyl-5-O-acyl-2-azido-2-deoxyuarabinofuranose of the formula



wherein R^3 is hydrocarbylcarbonyl of 2 to 12 carbon atoms, and

(e) chlorinating the product of step (d), through the use of titanium tetrachloride or stannic chloride as chlorinating agent, to obtain 2-azido-2-deoxyarabinofuranosyl chloride of the formula



4,321,367

METHOD FOR THE PREPARATION OF CROSS-LINKED POLYSACCHARIDE ETHERS

Wen-Jiu Cheng, and Ernie V. Luoma, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 2, 1980, Ser. No. 182,889
Int. Cl.³ C08G *59/68*
U.S. Cl. 536—88 **14 Claims**

1. A method for preparing a cross-linked polysaccharide ether, soluble in an aqueous liquid, said method comprising the step of contacting a polysaccharide prior to, simultaneous with or subsequent to the etherification thereof, with an amount of a polyhalo hydrocarbon selected from the group consisting of a polyhalo methane and an alkylene, alkylidene or halo substituted alkylene or alkylidene polyhalide bearing two halo substituent groups, wherein each halo group is bonded to a primary or secondary carbon atom of an alkylene, alkylidene or halo substituted alkylene or alkylidene group of two or more carbon atoms, at conditions sufficient to cross-link the polysaccharide without substantial amounts of the resulting cross-linked polysaccharide ether being insoluble in water.

4,321,368

GLYCOSYL TRIIDOBENZOIC ACID DERIVATIVES

George B. Hoey, Ferguson, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 624,011, Oct. 20, 1975, Pat. No. 4,225,775. This application May 1, 1980, Ser. No. 145,292
Int. Cl.³ C07H *13/00*
U.S. Cl. 536—119 **2 Claims**

2. 2,3,4,6-Tetra-O-acetyl-1-glucopyranosyl-3-Acetamido-2,4,6-triiodo-N-methyl isophthalamate.

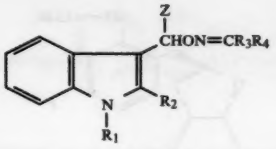
4,321,369

COMPOSITIONS, PROCESS AND SYSTEMS

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 127,649, Mar. 6, 1980, Pat. No. 4,283,077. This application Jan. 19, 1981, Ser. No. 226,133
Int. Cl.³ C07D *209/12, 401/12, 403/12*
U.S. Cl. 542—415 **7 Claims**

1. A compound having the formula



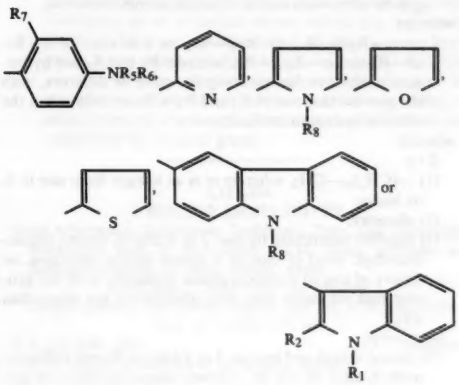
wherein:

R_1 is hydrogen or lower-alkyl;

R_2 is hydrogen, lower-alkyl or phenyl;

R_3 and R_4 are independently hydrogen, alkyl containing 1–8 carbon atoms, benzyl, phenyl, phenyl substituted with 1 or 2 halo, lower-alkyl, lower-alkoxy or di-lower-alkylamino groups, or CR_3R_4 is cyclopentyl, cyclohexyl or cycloheptyl, provided that R_3 and R_4 are not simultaneously hydrogen; and

Z is naphthyl, biphenylyl, phenyl, phenyl substituted with 1 or 2 lower-alkyl, lower-alkoxy, halo or nitro groups or Z is substituent having the formula



where in the above formulas

R_5 and R_6 are independently lower-alkyl or benzyl;

R_7 is hydrogen, lower-alkyl, lower-alkoxy, halo or di-lower-alkylamino, and

R_8 is hydrogen or lower-alkyl.

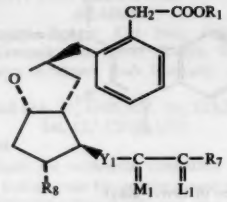
4,321,370

2,5-INTER-O-PHENYLENE-3,4-DINOR-6,9α-EPOXY-6β-PGF_1 COMPOUNDS

Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,837
Int. Cl.³ C07D *307/935*
U.S. Cl. 542—426 **1 Claim**

1. A prostacyclin analog of formula VI



wherein

R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein

Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

(4) —C≡C—,

wherein

M_1 is α—R_5:β—OH or α—OH:β—R_5, wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein

L_1 is α—R_3:β—R_4, α—R_4:β—R_3, or a mixture of α—R_3:β—R_4 and α—R_4:β—R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein

R_7 is

(1) $—(CH_2)_m—CH_3$, wherein m is an integer from one to 5, inclusive;

(2) phenoxy;

(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(4) phenyl;

(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(6) phenylmethyl, phenylethyl, or phenylpropyl; or

(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein

R_1 is

(1) hydrogen;

(2) alkyl of one to 12 carbon atoms, inclusive;

(3) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(4) aralkyl of 7 to 12 carbon atoms, inclusive;

(5) phenyl;

(6) phenyl substituted with one, 2 or 3 chloro or alkyl of one to 3 carbon atoms;

(7) phenyl substituted in the para position by

(a) —NH—CO—R_{25},

(b) —CO—R_{26},

(c) —O—CO—R_{27}, or

(d) $—CH=N—NH—CO—NH_2$

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is hydroxy, methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is phenyl or acetamidophenyl, inclusive, or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

4,321,371

SUBSTITUTED N-BENZOYLANTHRANILIC ACID DERIVATIVES AND THEIR ANHYDRO COMPOUNDS

Adolf Parg, Bad Durkheim; Bruno Wuerzer, Otterstadt, and Gerhard Hamprecht, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

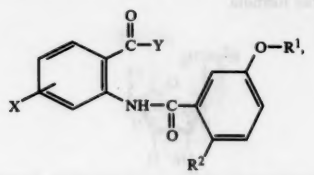
Filed Aug. 15, 1980, Ser. No. 178,677

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1979, 2934543

Int. Cl.[3] **C07D** *265/12;* **C07C** *79/46;* **C07D** *211/86, 213/62*

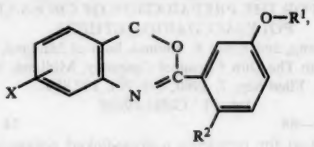
U.S. Cl. 544—92 **7 Claims**

1. A compound of the formula



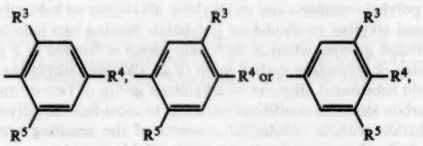
I

a compound of the formula

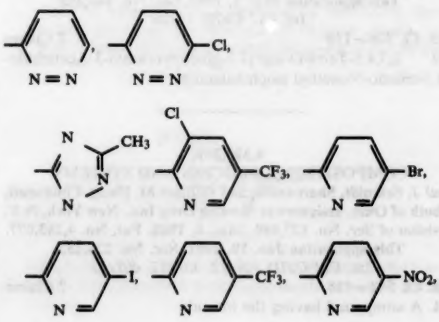


II

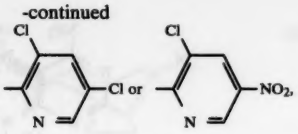
where R^1 is a substituted phenyl of the formula



where R^3, R^4 and R^5 are each, independently of one another, hydrogen, halogen, nitro, cyano or carboxyl, or alkyl, haloalkyl, alkoxy, haloalkoxy, alkylmercapto, haloalkylmercapto, alkylsulfinyl or alkylsulfonyl each of 1 to 4 carbon atoms, or R^1 is heteroaryl of the formula



-continued



R^2 is hydrogen, nitro, cyano or halogen,

X is hydrogen, halogen, nitro or cyano, or is alkyl, haloalkyl, alkoxy, haloalkoxy, haloalkylmercapto or alkylmercapto, each of 1 to 4 carbon atoms, and

Y is —OR^6 or

where

R^6 is hydrogen or alkyl, alkenyl or alkynyl each of up to 4 carbon atoms, or one equivalent of an alkaline earth metal cation or of an alkali metal cation or of an ammonium ion which is unsubstituted or substituted by alkyls of 1 to 4 carbon atoms, and

R^7 and R^8 independently of one another are hydrogen or alkyl of 1 to 4 carbon atoms.

4,321,372

ANTIULCER THIAZOL-2-YLCARBAMOYL-CARBOXYLIC ACIDS, ESTERS AND AMIDES

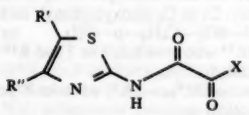
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 16, 1980, Ser. No. 160,046

Int. Cl.³ C07D *277/20*

U.S. Cl. 544—133 **22 Claims**

1. A compound of the formula



wherein

X is hydroxy, (C_1–C_5)-alkoxy, phenoxy, benzyloxy, or —$NH(CH_2)_nY$ wherein n is an integer of value 2 to 4 and Y is di-(C_1–C_3)-alkylamino, 1-pyrrolidinyl, 1-piperidinyl or 4-morpholinyl;

R′ and R″ when taken together are (C_3–C_8)-alkylene, with the proviso that the ring so formed is 5- to 8-membered;

R′ and R″ when taken separately are each independently hydrogen, (C_1–C_6)-alkyl or (C_5–C_6)-cycloalkyl, with the proviso that when X is other than —$NH(CH_2)_nY$, at least one of R′ and R″ is other than hydrogen;

the pharmaceutically acceptable cationic salts thereof when X is hydroxyl, and the pharmaceutically acceptable anionic salts thereof when X is —$NH(CH_2)_nY$.

4,321,373

2-HYDROXY-3-NAPHTHOIC ACID AMIDES

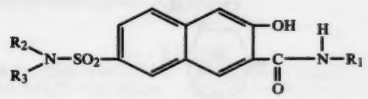
Siegfried Scheler, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 21,104, Mar. 16, 1979. This application Aug. 29, 1980, Ser. No. 182,389

Int. Cl.³ C07D *295/14;* **C07C** *143/53*

U.S. Cl. 544—159 **9 Claims**

1. 2-hydroxy-3-naphthoic acid amides of the general formula



wherein

R_1 is hydrogen, an alkyl group containing up to 4 carbon atoms, a cycloalkyl group containing up to 12 carbon atoms, an aralkyl group containing up to 10 carbon atoms, or an aryl group containing up to 10 carbon atoms, which may be substituted by a hydroxy group, an alkyl group which may be substituted by halogen atoms, an alkoxy group, an acyl group, a halogen atom, by amino groups which may be substituted by alkyl groups, or by heterocycles having from 5–8 ring members as pyrrolidine, piperidine, piperazine, thiomorpholine, hexamethyleneimine or morpholine; and

R_2 and R_3 are identical or different and represent hydrogen, an alkyl group containing up to 6 carbon atoms, a cycloalkyl group containing up to 6 carbon atoms, an aralkyl group containing up to 10 carbon atoms, or an aryl group containing up to 10 carbon atoms, which may be substituted by a hydroxy, or lower alkyl, an alkoxy, or an acyl group, or by a halogen atom or which, together with the nitrogen atom to which they are attached, represent a pyrrolidine, a piperidine, a piperazine, a thiomorpholine, a morpholine, or a hexamethyleneimine ring which may be substituted by an alkyl group.

4,321,374

TRIAZINE DERIVATIVES

Syoji Morimura, Yokohama; Toshimasa Toda, and Tomoyuki Kurumada, both of Hiromachi, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

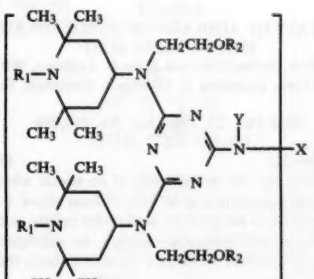
Filed Jun. 3, 1980, Ser. No. 156,020

Claims priority, application Japan, Jun. 23, 1979, 54/79419

Int. Cl.³ C07D *401/14*

U.S. Cl. 544—198 **6 Claims**

1. A s-triazine derivative having the formula



(I)

wherein

R_1 represents hydrogen atom or methyl group,

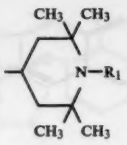
R_2 represents hydrogen atom, an alkanoyl group having from 2 to 18 carbon atoms or 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyl group,

n is 1 or 2,

when n is 1,

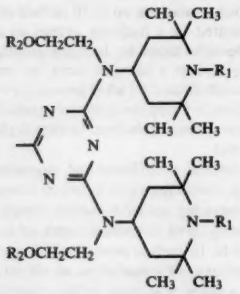
X represents an alkyl group having from 1 to 18 carbon atoms, benzyl group or a group of the formula —$CH_2CH_2OR_2$ (R_2 is as defined above) and

Y represents hydrogen atom, a group of the formula



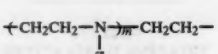
(II)

or a group of the formula



(III)

(wherein R_1 and R_2 are as defined above), when n is 2, X represents an alkylene group having from 2 to 6 carbon atoms, xylylene group or a group of the formula



(wherein m is an integer from 1 to 4 and
Y represents a group of the above formula (III)) and
Z represents hydrogen atom or a group of the above formula (II).

4,321,375

ACETALS OF ADDUCTS OF ACROLEIN AND ISOCYANURIC ACID

Saul M. Cohen, Springfield, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1980, Ser. No. 219,208
Int. Cl.³ C07D *251/34*
U.S. Cl. 544—221 **19 Claims**

1. A process for the preparation of an acetal which comprises reacting isocyanuric acid with at least about 1 mole of acrolein per mole of isocyanuric acid under mildly acid conditions to form an aldehyde and reacting the aldehyde with a monohydric primary or secondary alcohol to form the acetal.

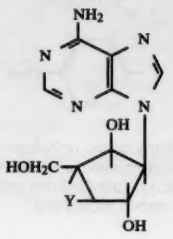
4,321,376

NEPLANOCIN-B AND -F

Masaru Otani; Satoshi Yaginuma; Masatoshi Tsujino; Naoki Muto; Tetsu Saito, all of Shizuoka, and Tadashiro Fujii, Mishima, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 7, 1979, Ser. No. 101,126
Claims priority, application Japan, Feb. 23, 1979, 54-21201
Int. Cl.³ C07D *473/32*
U.S. Cl. 544—277 **3 Claims**

1. Neplanocins of the formula



wherein Y is oxygen or a valence bond.

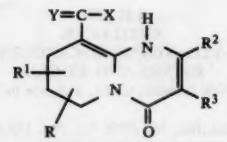
4,321,377

SUBSTITUTED-4-OXO-1,6,7,8-TETRAHYDRO-4H-PYRIDO[1,2-a]PYRIMIDINES

Istvan Hermecz; Zoltan Meszaros; Istvan Bitter; Agnes Horvath, and Lelle Vasvari nee Debreczy, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed May 2, 1979, Ser. No. 35,279
Int. Cl.³ C07D *471/04;* A61K *31/505*
U.S. Cl. 544—282 **4 Claims**

1. A compound of the formula (I')



or a tautomer, optically active antipode, or pharmaceutically acceptable salt thereof wherein

R, R^1 and R^2 are each hydrogen or C_1 to C_4 alkyl;

R^3 is carboxy, C_1 to C_6 alkoxycarbonyl, carbamoyl, cyano, —CONH—SO_2—C_6H_4—p—CH_3 or —$(CH_2)_s$—$COOR^{14}$ wherein s is 1, 2 or 3 and R^{14} is hydrogen or C_1 to C_4 alkyl;

X is halogen, —$OR^4{}_1$, —$SR^4{}_1$ wherein $R^4{}_1$ is hydrogen or C_1 to C_4 alkyl, or

X is —$N(R^4)(R^5)$ wherein

R^4 is chloroacetyl, C_1 to C_4 alkyl, tosyl, phenyl, naphthyl, or phenyl or naphthyl substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxy, amino, hydroxy, carboxy, C_1 to C_4 alkoxycarbonyl, nitrile, carbamoyl, carbohydrazido, nitro or halogen;

R^5 is hydrogen or C_1 to C_4 alkyl; and

Y is oxygen, sulfur, or =N—R^7 wherein R^7 is C_1 to C_4 alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxy, amino, hydroxy, carboxy, C_1 to C_4 alkoxycarbonyl, nitrile, carbamoyl, carbohydrazido, nitro or halogen.

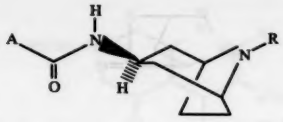
4,321,378

8-(5-PYRIMIDINECARBOXAMIDE)NOR-TROPANE DERIVATIVES

Philippe L. Dostert, Paris; Thierry F. Imbert, Noisy le Roi, and Bernard P. Bucher, Marnes la Coquette, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 110,067, Jan. 7, 1980. This application Apr. 16, 1981, Ser. No. 254,683
Claims priority, application France, Jan. 16, 1979, 7900971; Dec. 26, 1979, 79 31656
Int. Cl.³ C07D *401/14;* A61K *31/505*
U.S. Cl. 544—321 **6 Claims**

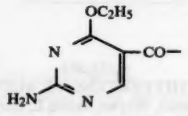
1. A compound having the formula



(I)

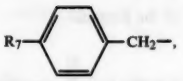
in which R and ACO are selected from the following combinations:

1. R is unsubstituted benzyl, and A—CO— is

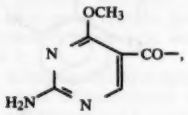


and

2. R is



wherein R_7 is methyl, methoxy, bromo or chloro, and ACO is



and pharmacologically acceptable acid addition salts thereof.

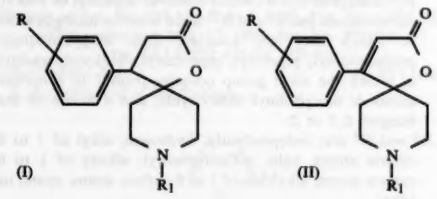
4,321,379

4-ARYL-1-OXA-8-AZASPIRO[4,5]DEC-3-EN-2-ONES

John J. Brown, New City, N.Y., and Robert A. Hardy, Jr., Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 28, 1981, Ser. No. 229,043
Int. Cl.³ C07D *491/107*
U.S. Cl. 546—16 **14 Claims**

1. A compound selected from the group consisting of those of the formulae:



(I) (II)

wherein R is hydrogen, fluoro, chloro or trifluoromethyl and R_1 is hydrogen, alkyl having up to 4 carbon atoms, alkanoyl having up to 4 carbon atoms, alkenyl having from 3 to 6 carbon atoms, cycloalkylmethyl having from 4 to 7 carbon atoms, phenylalkyl having from 7 to 10 carbon atoms, ω-benzoylalkyl having from 8 to 11 carbon atoms, ω-(p-fluorophenyl)alkyl having from 7 to 10 carbon atoms, ω-di (p-fluorophenyl)alkyl having from 13 to 16 carbon atoms or ω-(p-fluorobenzoyl)alkyl having from 8 to 11 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof.

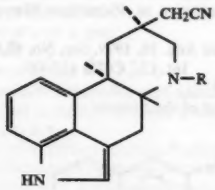
4,321,380

ALKYL CYANOMETHYL ERGOLINE-I DERIVATIVES AND SALTS THEREOF, AND METHODS FOR THEIR PREPARATION

Antonin Cerny; Miroslav Semonsky; Rudolf Kotva; Karel Rezabek; Marie Auskova, and Miroslav Seda, all of Prague, Czechoslovakia, assignors to SPOFA, United Pharmaceutical Works, Prague, Czechoslovakia

Filed Dec. 13, 1976, Ser. No. 749,995
Claims priority, application Czechoslovakia, Dec. 13, 1975, 8472-75
Int. Cl.³ C07D *457/02*
U.S. Cl. 546—67 **7 Claims**

1. D-6-alkyl-8-cyanomethylergoline-I of the formula



wherein R is an alkyl group of from 2–4 carbon atoms.

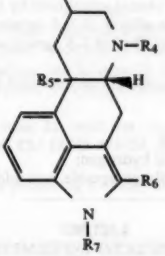
4,321,381

ERGOT DERIVATIVES

Sergio Mantegani; Guiliana Arcari; Anna M. Caravaggi, and Germano Bosisio, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Italy

Continuation-in-part of Ser. No. 72,289, Sep. 4, 1979, Pat. No. 4,252,941. This application Sep. 19, 1980, Ser. No. 188,620
Claims priority, application United Kingdom, Sep. 8, 1978, 36080/78
The portion of the term of this patent subsequent to Feb. 24, 1998, has been disclaimed.
Int. Cl.³ A61K *31/48, 31/495;* C07D *457/02*
U.S. Cl. 546—67 **21 Claims**

1. A compound of formula (I):



(I)

wherein

R_1 represents phenyl, piperidino, 1-pyrrolidinyl, morpholino or 4-methyl-1-piperazinyl, alkyl or alkoxy having from 1 to 4 carbon atoms, amino, substituted amino group of the formula NHR' (wherein R' represents an alkyl having from 1 to 4 carbon atoms, a cycloalkyl, benzyl, or phenyl)

or amino of the formula NR'' R''' (wherein R'' and R''' both represent alkyl having from 1 to 4 carbon atoms);
R_2 represents a hydrogen atom, alkyl from 1 to 4 carbon atoms, or phenyl;
R_3 represents a fluorine atom, cyano, difluoromethyl, difluorobromomethyl, trifluoromethyl, methylthio, methylsulphonyl, sulphonamido, alkoxy having from 1 to 4 carbon atoms, alkanoyl having 2 to 5 carbon atoms, or benzoyl;
R_4 represents a hydrocarbon group having from 1 to 4 carbon atoms;
R_5 represents a hydrogen atom or methoxy;
R_6 represents a hydrogen or halogen atom or methyl; and
R_7 represents a hydrogen atom or methyl.

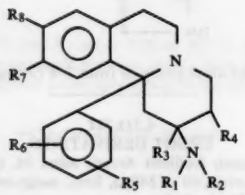
4,321,382

2-AMINO-11B-ARYL-BENZO[a]QUINOLIZINES

Charles A. Lundberg, Jr., and Robert A. Farr, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Aug. 10, 1979, Ser. No. 65,668
Int. Cl.³ C07D *455/06*
U.S. Cl. 546—95 **2 Claims**

1. A compound of the formula



wherein
R_1 is hydrogen, a straight or branched chain alkyl of 1–5 carbon atoms or a straight or branched chain alkanoyl of 1–5 carbon atoms;
R_2 is hydrogen, a straight or branched chain alkyl of 1–5 carbon atoms, phenyl, phenyl substituted with halogen, a straight or branched chain alkoxy of 1–5 carbon atoms, a straight or branched chain alkyl of 1–5 carbon atoms or trifluoromethyl or, when R_1 is hydrogen, R_2 can also be straight or branched chain alkanoyl of 1–5 carbon atoms; or
R_1 and R_2 taken together with the nitrogen atom to which they are attached are azetidine, pyrrolidine, piperidine, hexahydroazepine, morpholine or piperazine;
R_3 is hydrogen, primary or secondary alkyl of 1–5 carbon atoms, phenyl or phenyl substituted by halogen, a straight or branched chain alkoxy of 1–5 carbon atoms, a straight or branched chain alkyl of 1–5 carbon atoms or trifluoromethyl;
R_4 is hydrogen or a straight or branched chain alkyl of 1–5 carbon atoms;
R_5 is 4-fluoro;
R_6 is hydrogen; and
each of R_7 and R_8 is hydrogen;
or a pharmaceutically acceptable acid addition salt thereof.

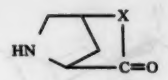
4,321,383

HETEROBICYCLO INTERMEDIATES

Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 209,780, Nov. 24, 1980, Pat. No. 4,303,662.
This application Jun. 25, 1981, Ser. No. 277,299
Int. Cl.³ C07D *471/08, 487/08, 495/08*
U.S. Cl. 546—113 **2 Claims**

1. A compound of the formula



wherein
X is $-(CH_2)_mZ-$;
Z is sulfur or imino;
m is 0 or 1 or an acid halogen salt thereof.

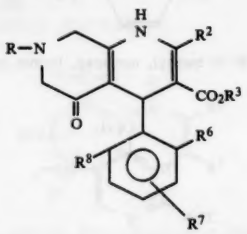
4,321,384

ANTIHYPERTENSIVE AGENTS

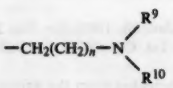
Theodore S. Sulkowski, Wayne; James L. Bergey, Lansdale, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,911
Int. Cl.³ C07D *471/02*
U.S. Cl. 546—123 **24 Claims**

1. A compound of the formula:

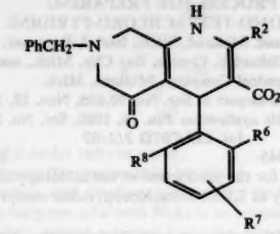


in which
R is hydrogen or alkyl of 1 to 6 carbon atoms;
R^2 is alkyl of 1 to 6 carbon atoms;
R^3 is alkyl of 1 to 6 carbon atoms, alkoxyalkyl in which each alkyl moiety has 1 to 6 carbon atoms, $-CH_2CF_3$, $-CH_2CH_2CF_3$ or



where R^9 is hydrogen or alkyl of 1 to 6 carbon atoms and R^{10} is alkyl of 1 to 6 carbon atoms or arylalkyl of 7 to 10 carbon atoms and R^9 and R^{10} taken with the nitrogen atom to which they are attached form a pyrrolidinyl, imidazolidinyl, piperidyl, piperazinyl, 4-alkylpiperazinyl in which the alkyl group contains from 1 to 6 carbon atoms or morpholinyl heterocycle, and n is one of the integers 0, 1 or 2;
R^6 and R^8 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, cyano or nitro;
R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, cyano or nitro;
and
R^6 and R^7 when in ortho position to each other and taken together are butadienylene, tetramethylene or trimethylene;
or a pharmaceutically acceptable salt thereof.

18. A compound of the formula:

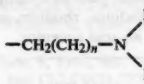


in which

$PhCH_2$is benzyl;

R^2 is alkyl of 1 to 6 carbon atoms;

R^3 is alkyl of 1 to 6 carbon atoms, alkoxyalkyl in which each alkyl moiety has 1 to 6 carbon atoms, $-CH_2CF_3$, $-CH_2CH_2CF_3$ or



where R^9 is hydrogen or alkyl of 1 to 6 carbon atoms and R^{10} is alkyl of 1 to 6 carbon atoms or arylalkyl of 7 to 10 carbon atoms and R^9 and R^{10} taken with the nitrogen atom to which they are attached form a pyrrolidinyl, imidazolidinyl, piperidyl, piperazinyl, 4-alkylpiperazinyl in which the alkyl group contains from 1 to 6 carbon atoms or morpholinyl heterocycle, and n is one of the integers 0, 1 or 2;

R^6 and R^8 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, cyano or nitro;

R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, halo, trifluoromethyl, cyano or nitro;

and

R^6 and R^7 when in ortho position to each other and taken together are butadienylene, tetramethylene or trimethylene;

or a pharmaceutically acceptable salt thereof.

4,321,385

[(ARYL-1-PYRRYL) METHYL]-PIPERIDINOLS AND PYRROLIDINOLS

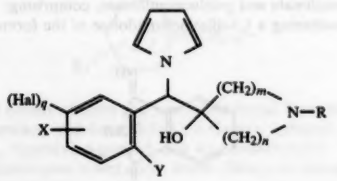
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Joseph T. Klein, Bridgewater, all of N.J., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 118,146, Feb. 4, 1980, Pat. No. 4,268,515. This application Nov. 17, 1980, Ser. No. 207,536

Int. Cl.³ C07D *401/06, 403/06*

U.S. Cl. 546—208 **10 Claims**

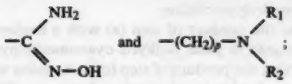
1. A compound of the formula



wherein

Y is a halogen;

R is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety has 1 to 6 carbon atoms, phenoxycarbonyl, cyano, phenylalkyl where the alkyl moiety has 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms, phenylalkanoyl where the alkanoyl moiety has 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, benzoylalkyl where the alkyl moiety has 1 to 6 carbon atoms,



p is an integer of 2 and 3; and

R_1 and R_2 are the same or different and are hydrogen and lower alkyl of 1 to 6 carbon atoms;

X is hydrogen and alkyl of 1 to 6 carbon atoms;

Hal is halogen;

q is an integer of 0 or 1;

m is an integer of 1 or 2; and

n is an integer of 1, 2 or 3,

where the sum of m and n is 3 or 4;

and a pharmaceutically acceptable acid addition salt thereof.

3. The compound as defined in claim 1 wherein m is 2 and the sum of m and n is 4.

4. The compound as defined in claim 3 which is 4-[(o-fluorophenyl)-(1-pyrryl)methyl]-1-methyl-4-piperidinol or a pharmaceutically acceptable acid addition salt thereof.

4,321,386

QUATERNARY PIPERIDINIUM HALIDES

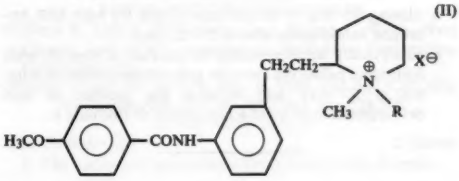
John E. Lawson, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Jan. 28, 1981, Ser. No. 229,244

Int. Cl.³ C07D *211/34*

U.S. Cl. 546—234 **3 Claims**

1. A compound having Formula II



(II)

wherein R is lower alkyl or benzyl and X is halide.

4,321,387

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE NICOTINE ANALOGS

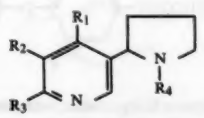
Charles G. Chavdarian, and Edward B. Sanders, both of Richmond, Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,558

Int. Cl.³ C07D *401/04, 207/12*

U.S. Cl. 546—281 **28 Claims**

1. A process for preparing a compound represented by the formula (I'):



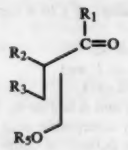
wherein R_1 R_2, and R_3 are hydrogen or a straight chain or

branched alkyl group with 1 to 10 carbon atoms and R_4 is a straight chain or branched alkyl group with 1 to 10 carbon atoms, which comprises the following steps:

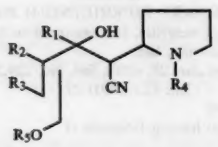
a. treating 1-alkylprolinol in an aprotic solvent with a reagent capable of replacing the hydroxyl group by halogen, said reagent being selected from the group consisting of thionyl chloride, thionyl bromide, phosphorus oxychloride, and phosphorus tribromide, and recovering 1-alkyl-2-halomethylpyrrolidine;

b. treating the product of step (a) with a nucleophilic cyanide reagent to yield 1-alkyl-2-cyanomethylpyrrolidine;

c. converting the product of step (c) to its anion with lithium diisopropylamide in an aprotic solvent at −70° to 25° C. and condensing it with a compound represented by the formula (VIII):



wherein R_1, R_2, and R_3 are as described above and R_5 is a straight chain or branched alkyl group with 1 to 10 carbon atoms, yielding a compound represented by the formula II':



d. closing the ring of the product of step (c) with 30% hydrogen halide-acetic acid at 55° C.; and

e. catalytically dehalogenating the product of step (d) with hydrogen/palladium chloride and sodium acetate in ethanol at 50 p.s.i. and isolating the product of said dehalogenation to yield a compound of Formula I'.

4,321,388

N-BENZOYL N'-PYRIDYLOXY PHENYL UREA

Ryuzo Nishiyama, Takatsuki; Hiroyuki Mori; Yasuo Ogawa, both of Moriyama; Takahiro Haga, and Kuniaki Nagatani, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

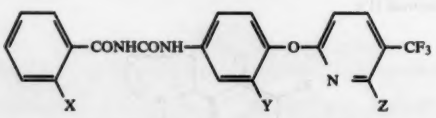
Filed Sep. 2, 1980, Ser. No. 183,281

Claims priority, application Japan, Sep. 11, 1979, 54-116359

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—291 **6 Claims**

1. N-benzoyl N'-pyridyloxy phenyl urea having the formula



wherein X represents a halogen atom, nitro, methyl, or trifluoromethyl group; Y represents a halogen or hydrogen atom group; and Z represents a halogen atom.

4,321,389

PROCESS FOR PREPARING 4-BROMO-TETRACHLORO-PYRIDINE

G. Edwin Vrieland, Midland, Mich.; Bart J. Bremmer, Ashland, Mass., and Richard E. Crooks, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 95,695, Nov. 19, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,333

Int. Cl.³ C07D *213/02*

U.S. Cl. 546—345 **20 Claims**

1. A process for the production of tetrachloropyridine consisting primarily of 2,3,5,6-tetrachloropyridine comprising the steps of

(a) reacting by contacting pentachloropyridine with a bromide salt selected from alkali metal bromides, alkaline earth bromides, ammonium bromide or mixtures thereof, in the presence of a polar aprotic organic solvent at temperatures between about 100° C. and about 140° C. to form bromotetrachloropyridine-containing crude product; and subsequently

(b) reducing the bromotetrachloropyridine produced in step (a) by contacting with gaseous hydrogen in the presence of a platinum, palladium, rhodium or ruthenium noble metal catalyst and an acid acceptor.

4,321,390

PREPARATION OF INSOLUBLE METAL COMPLEX COLORANTS

Volker Radtke, Hassloch, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

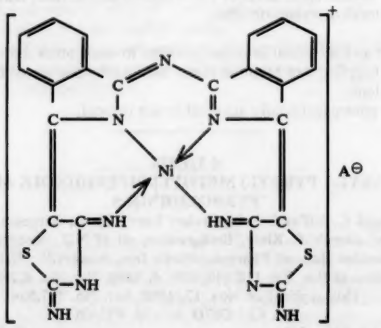
Filed Apr. 8, 1980, Ser. No. 138,286

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916697

Int. Cl.³ C07F *15/04*

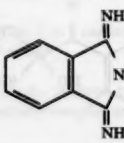
U.S. Cl. 548—109 **6 Claims**

1. A process for the preparation of an insoluble metal complex colorant of the formula:

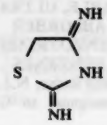


wherein A is one equivalent of an anion selected from the group consisting of bromide, chloride, iodide, nitrate, acetate, benzenesulfonate and p-toluenesulfonate, comprising:

(a) condensing a 1,3-diiminoisoindoline of the formula:



with a thiazolidine of the formula:



in a 1:1 molar ratio in water;

(b) isolating the condensation product;

(c) reacting said condensation product in the form of an aqueous press cake with NiA_2 in an aprotic, polar, water-miscible solvent selected from the group consisting of dimethylformamide, N-methylpyrrolidone, dimethylsulfoxide, hexamethylphosphorotriamide and dimethylacetamide; and

(d) obtaining said insoluble metal complex colorant.

4,321,391
PREPARATION OF L-ASPARTIC ACID N-THIOCARBOXYANHYDRIDE

Fredric J. Vinick, Waterford, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Nov. 5, 1980, Ser. No. 204,135
Int. Cl.³ C07D 277/04
U.S. Cl. 548—183 **13 Claims**

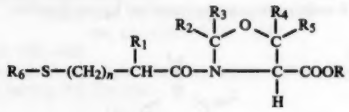
1. A process for the preparation of L-aspartic acid N-thiocarboxyanhydride comprising contacting an L-aspartic anhydride addition salt with carbonyl sulfide in a non-protic reaction medium in the presence of a non-nucleophilic base at a temperature from about −78° C. to about 25° C.

4,321,392
MERCAPTOACYL DERIVATIVES OF 4-OXAZOLIDINE-CARBOXYLIC ACIDS

Denis E. Ryono, and Miguel A. Ondetti, both of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 6, 1980, Ser. No. 119,079
Int. Cl.³ A61K 31/42; C07D 263/04
U.S. Cl. 548—215 **7 Claims**

1. A compound of the formula

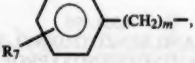


and basic salts thereof wherein:

R is hydrogen or lower alkyl;

R_1 is hydrogen, lower alkyl, lower alkylthio, mercapto lower alkylene, or halo substituted lower alkyl;

R_2, R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen, lowe alkyl, halo substituted lower alkyl,



and hetero wherein said hetero is selected from the group consisting of 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, and 4(or 5)-imidazolyl;

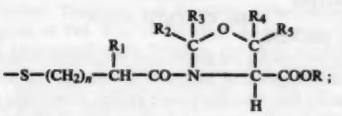
R_7 is hydrogen, lower alkyl, lower alkoxy, or halogen;

n is zero or one;

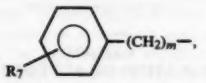
m is zero, one or two;

R_6 is hydrogen,

p-methoxybenzyl, p-methoxybenzyloxycarbonyl, trityl, t-butoxycarbonyl, or when R_1 is other than mercapto-lower alkylene a sulfide of the formula



and R_8 is lower alkyl, halo substituted lower alkyl,



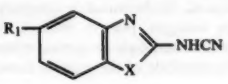
or hetero $-(CH_2)_m-$ wherein R_7, m, and hetero are as defined above.

4,321,393
METHOD FOR PREPARING 2-CYANAMIDOBENZIMIDAZOLES OR 2-CYANAMIDOBENZOXAZOLES

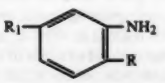
Clifford S. Labaw, Philadelphia, and Robert L. Webb, West Chester, both of Pa., assignors to SmithKline Corporation, Philadephia, Pa.

Division of Ser. No. 117,158, Jan. 31, 1980, Pat. No. 4,285,878.
This application Jan. 14, 1981, Ser. No. 224,780
Int. Cl.³ C07D 235/04
U.S. Cl. 548—222 **2 Claims**

1. The method of preparing a compound of the formula:



in which X is —O— or —NH— and R_1 is hydrogen, halo, acetyl, lower alkyl, lower alkoxy, lower alkylthio, lower alkyl sulfinyl, phenylthio, phenyloxy, phenylsulfinyl, cyclohexylthio, cyclohexyloxy, cyclohexylsulfinyl or thienylcarbonyl, said lower alkyl and lower alkoxy groups having 1–6 carbons, comprising reacting N-cyanodiphenoxyiminocarbonate with a compound of the formula:



in which R is hydroxy or amino and R_1 is as defined above in an organic solvent in which the reactants are soluble at reflux temperature until reaction is complete.

4,321,394

PROCESS FOR THE PRODUCTION OF ADDITION COMPOUNDS OF CARBODIIMIDES AND COMPOUNDS CONTAINING HYDROXYL GROUPS

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,103

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941253

Int. Cl.³ C07D *263/08*

U.S. Cl. 548—234 8 Claims

1. In a process for the production of addition compounds of compounds containing hydroxyl groups and carbodiimides substantially free from isocyanate groups, comprising reacting the reactants in the presence of from 0.01 to 3% by weight, based on the reaction mixture, of a metal catalyst, the improvement wherein a tin compound is used as said metal catalyst.

4,321,395

PREPARATION OF ACETANILIDES

Karl Eicken, Wachenheim; Wolfgang Rohr, Mannheim, and Friedrich Linhart, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

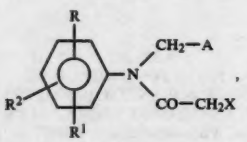
Filed May 18, 1979, Ser. No. 40,224

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830764

Int. Cl.³ C07D *233/20, 257/04, 207/10, 249/02*

U.S. Cl. 548—253 9 Claims

1. A process for the preparation of an acetanilide of the formula I



I

where

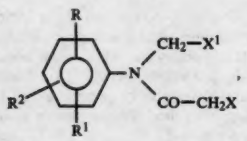
R is alkyl of up to 5 carbon atoms,

R^1 is alkyl of up to 5 carbon atoms

R^2 is hydrogen,

X is chlorine or bromine, and

A is an imidazolyl, pyrrolyl, pyrazolyl, triazolyl, or tetrazolyl group which is bonded via a ring nitrogen and may be monosubstituted, disubstituted or trisubstituted on its ring members by halogen, phenyl, methyl, ethyl, isopropyl, methoxy, trifluoromethyl, or cyano, wherein a 2-halo-N-halomethylacetanilide of the general formula II



II

where R, R^1, R^2 and X have the above meanings and X^1 has the same meanings as X, and X and X^1 may be identical or different, is reacted at −30° C. up to 100° C. with an at least one molar amount of azole of the formula H-A per mole of said acetanilide, where A has the above meanings, in the presence of an at least one molar amount of an aqueous alkali per mole of said acetanilide, in a water immiscible liquid organic solvent-aqueous two-phase system with vigorous agitation of the two-phase system.

4,321,396

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER ALLYLOXY-2-(2H-BENZOTRIAZOL-2-YL)-4-ALKYL-BENZENES

Donald H. Lorenz, Basking Ridge, N.J., and Bruce A. Gruber, Worthington, Ohio, assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 112,882, Jan. 17, 1980, abandoned. This application Dec. 10, 1980, Ser. No. 215,196

Int. Cl.³ C07D *249/20*

U.S. Cl. 548—260 1 Claim

1. A compound which is 4'-vinylbenzyloxy-2-(2H-benzotriazol-2-yl)-4-methylbenzene.

4,321,397

4-AMINOANTIPYRINE DYE FOR THE ANALYTIC DETERMINATION OF HYDROGEN PEROXIDE

Paul T. Nix, Jackson, and Spencer M. Fields, Red Bank, both of N.J., assignors to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 8,154, Jan. 31, 1979, Pat. No. 4,247,631. This application Feb. 20, 1980, Ser. No. 123,017

Int. Cl.³ C07D *231/48, 231/46*

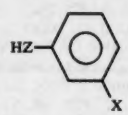
U.S. Cl. 548—366 5 Claims

1. A dye compound produced by a method which comprises:

contacting in an aqueous medium at a temperature of from about 20° to about 45° C., having a pH of from about 3 to about 9.5, and containing hydrogen peroxide,

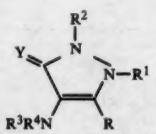
(1) peroxidase,

(2) an aminoaromatic acid represented by the formula:



wherein X is a mono or dialkylamino group having 1 to 6 carbons in each alkyl and ZH is the carboxyl or the sulfo group, and

(3) a 4-aminoantipyrine represented by the formula:



wherein each of R and R^1, when taken separately, is alkyl of 1 to 6 carbons, R^2 is phenyl or substituted phenyl wherein the substituents are lower alkyl or halogen, each of R^3 and R^4, when taken separately is hydrogen or alkyl of 1 to 6 carbons, and Y is oxygen or sulfur.

4,321,398

THIENYL AND BENZOTHIENYL-TERTIARY BUTYLAMINOPHENOXYPROPANOLS

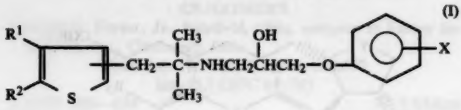
William L. Matier, Libertyville, Ill., and William E. Kreighbaum, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed May 7, 1981, Ser. No. 261,419

Int. Cl.³ C07D *333/20, 333/58*

U.S. Cl. 549—58 7 Claims

1. A compound selected from the group consisting of a compound having Formula (I)



(I)

wherein

X is lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, lower hydroxyalkyl (lower denoting 1 to 4 carbon atoms inclusive); benzyloxy; cyano; acylamino and cyanoalkyl (of 2 to 4 carbon atoms inclusive); cycloalkyl of 3 to 6 carbon atoms; carboxamido; halo; hydrogen; methylthio; nitro; or trifluoromethyl;

R^1 and R^2 are hydrogen or they are linked together to form a phenylene ring; and

the butylaminophenoxypropanol side chain is attached to either the 2- or 3- position of the thiophene nucleus.

4,321,399
PREPARATION OF 2-THIOPHENECARBONYL CHLORIDE

Stella S. Jones, Voorhees, N.J.; Christine B. Ogston, Philadelphia, and Robert L. Webb, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jun. 21, 1978, Ser. No. 917,720
Int. Cl.³ C07D *333/24*
U.S. Cl. 549—70 **7 Claims**

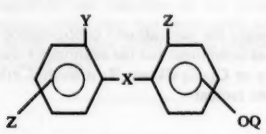
1. The method of producing 2-thiophenecarbonyl chloride comprising reacting substantially equimolar quantities of thiophene and phosgene in the presence of aluminum chloride in a chemically inert organic solvent which is capable of maintaining intact the phosgenealuminum complex and which is liquid at the reaction temperature at a temperature selected from the range of from about 0° down to the freezing point of said solvent.

4,321,400
ULTRAVIOLET LIGHT ABSORBING AGENTS AND COMPOSITIONS AND ARTICLES CONTAINING SAME

Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

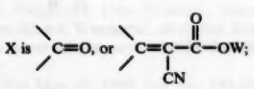
Filed May 30, 1980, Ser. No. 154,621
Int. Cl.³ C07F *7/10, 7/18*
U.S. Cl. 556—416 **3 Claims**

1. An ultraviolet light absorbing agent, comprising a compound having the formula:



wherein:

Y is H or OH;



Z is H, OH, OQ or OW, where at least one Z is OH if Y is H;

Q is $—CONH(CH_2)_3Si(R_2)_x(OR_1)_y$ or $—CONH(CH_2)_3Si(R_2)_x(OCOR_1)_y$; and

W is $—C_mH_{2m+1}$,

where x=0, 1 or 2, y=1, 2 or 3, x+y=3, R_1 and R_2, independently, are each alkyl having 1 to 6 carbon atoms and m=1 to 18.

4,321,401
PROCESS FOR THE MANUFACTURE OF PARTIAL HYDROLYSATES OF TETRA-(2-ALKOXYETHYL) SILICATES

Heinz Nestler, Troisdorf, and Friedhelm Schnippering, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Postfach, Fed. Rep. of Germany

Continuation of Ser. No. 13,647, Feb. 21, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,782
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809871
Int. Cl.³ C07F *7/08, 7/18*
U.S. Cl. 556—457 **13 Claims**

1. A process for the preparation of a partial hydrolyzate of an orthosilicic acid tetra(alkoxyalkyl) ester having a stable shelf life by contacting an orthosilicic acid tetra(alkoxyalkyl) ester with water, the improvement which consists essentially of carrying out the hydrolysis such that the entire amount of water necessary for the desired degree of hydrolysis is present in the reaction zone at the commencement of the reaction, said entire amount of water being 4 to 8.5 weight percent water based upon the combined amount of orthosilicic acid tetra(alkoxyalkyl) ester and water.

4,321,402
CARBAMATE PROCESS

Ji-Yong Ryu, Ramsey; Krishna K. Rao, Paterson; Ralph J. Spohn, Woodcliff Lake, and Robert Drogin, Linden, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 18, 1980, Ser. No. 179,065
Int. Cl.³ C07C *125/065, 125/073*
U.S. Cl. 560—24 **8 Claims**

1. A process for making N-aryl carbamic acid esters which comprises simultaneously reacting an aryl amide and a N-halogenating agent in the presence of alcohol at a temperature of from about 40° to about 200° C., while maintaining the pH of the resulting reaction medium of from neutral to basic by the addition of an aqueous solution of base said base being selected from the group consisting of NaOH, KOH, LiOH, and tri-alkyl amines, and while continually mixing the reactants for a period of from about 1 minute to 10 hours, and thereafter recovering the carbamate product.

4,321,403
N-METHYLPYRROLIDONE SOLVENT IN ESTERIFICATION OF CARBOXYBENZENES

Bruce C. Oxenrider, Florham Park, and Frank Mares, Whippany, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 4, 1979, Ser. No. 44,880
Int. Cl.³ C07C *67/08, 67/26*
U.S. Cl. 560—87 **5 Claims**

1. A process for esterification of a carboxybenzene which comprises contacting an anhydride of a carboxybenzene selected from the group consisting of hemimellitic acid, trimellitic acid, tetracarboxybenzenes, pentacarboxybenzenes and mellitic acid with a fluorinated alcohol having a straight chain, branched chain or cyclic fluorinated moiety of 2–20 carbons attached to a hydroxy substituted hydrocarbon moiety of 2–20 carbons or mixtrues thereof in a solvent consisting essentially of N-methylpyrrolidone.

4,321,404
COMPOSITIONS FOR PROVIDING ABHERENT COATINGS

Brian H. Williams, White Bear Lake, and Chung-I Young, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1980, Ser. No. 151,644
Int. Cl.³ C07C *125/073*; B41M *3/12*
U.S. Cl. 560—115 **3 Claims**

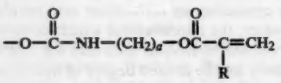
1. A novel poly(fluorooxyalkylene)urethane acrylate or methacrylate having the general formula:

$$Z\text{-}R_f^2\text{-}Y\text{-}A'$$

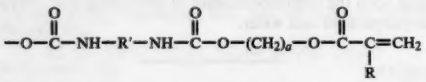
wherein:

R_f^2 is a divalent poly(fluorooxyalkylene) group having a number average molecular weight of from about 500 to 20,000;

A′ is selected from the group consisting of



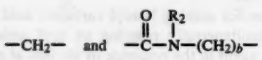
and



wherein:

R is selected from the group consisting of hydrogen and methyl, a is an integer having a value of 2 to 6, and R′ is selected from the group consisting of a divalent aliphatic or cycloaliphatic group having 2 to 14 carbon atoms and an aryl group having 6 to 14 carbon atoms;

Y is selected from the group consisting of



wherein:

b is 2 to 12, R^2 is selected from the group consisting of hydrogen, a lower alkyl of about 1 to 4 carbon atoms, and $-CH_2-_cA'$, wherein c is 2 to 3, and wherein when R^2 is $-CH_2-_cA$, b is 2 or 3; and

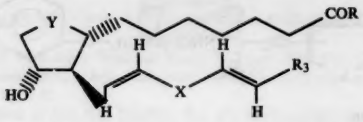
Z is selected from the group consisting of CF_3O-, $CF_3OCF(CF_3)O-$, —Y—A′, and wherein Y and A′ are defined as said Y and said A′ hereinabove.

4,321,405
15,16-DIOXY PROSTENOIC ACIDS AND ESTERS

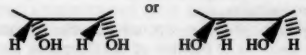
Martin J. Weiss, Oradell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 895,397, Apr. 11, 1978, Pat. No. 4,219,664, which is a division of Ser. No. 767,863, Feb. 11, 1977, Pat. No. 4,113,967, which is a continuation-in-part of Ser. No. 663,603, Mar. 3, 1976, abandoned. This application Apr. 21, 1980, Ser. No. 142,593
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—121 **37 Claims**

1. An optically active compound of the formula:

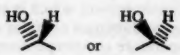


which represents the natural (nat.) configuration or a racemic mixture of the compound and the enantiomer thereof, wherein R is hydroxy or C_1–C_5 alkoxy; R_3 is methyl, ethyl or propyl; X is a divalent radical



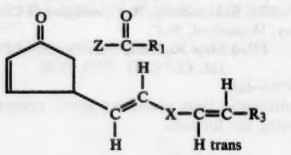
and

or a divalent radical selected from the group consisting of

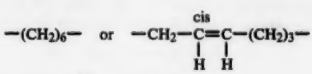


and the pharmacologically acceptable cationic salts thereof when R_1 is hydroxy.

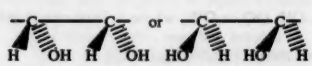
26. An optically active compound of the formula:



which represents the natural(nat.) configuration or a racemic mixture of that compound and the enantiomer thereof, wherein R_1 is hydroxy or C_1–C_5 alkoxy; R_3 is methyl, ethyl or propyl; Z is a divalent radical



X is a divalent radical



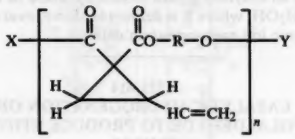
and the pharmacologically acceptable cationic salts thereof when R_1 is hydroxy.

4,321,406
VINYLCYCLOPROPANE MONOMERS AND OLIGOMERS

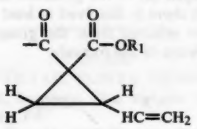
Richard G. Fayter, Jr., Fairfield, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Filed Jul. 17, 1980, Ser. No. 169,537
Int. Cl.³ C07C *69/743*
U.S. Cl. 560—124 **9 Claims**

1. Vinylcyclopropane monomers and oligomers of the formula



wherein R is a bivalent radical derived from a C_{2-12} aliphatic diol, C_{3-12} cycloaliphatic diol, C_{8-20} aromatic diol or ether diol having from 4 to 60 carbon atoms and 1 to 30 ether moieties, n is an integer from 1 to 20, X is hydroxy, alkoxy or the group —OROH where R is a bivalent radical as defined above and Y is hydrogen or the radical



where R_1 is hydrogen or a C_{1-4} alkyl group.

4,321,407
TREATMENT OF DIBASIC ESTERS WITH ALKALI METAL BOROHYDRIDES

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 17, 1980, Ser. No. 169,734
Int. Cl.³ C07C *67/62, 67/60, 69/40, 69/42*
U.S. Cl. 560—191 **4 Claims**

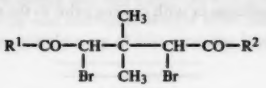
1. A method of reducing the color-forming tendency of esters obtained by esterifying alkanedioic acids having 4–12 carbon atoms which acids are produced by the nitric acid oxidation of cycloaliphatics selected from the class consisting of ketones, alcohols and mixtures of the foregoing which method comprises contacting said esters with an alkali metal borohydride in the presence of water and thereafter recovering the thus treated esters.

4,321,408
PREPARATION OF 1,3-DIBROMO-2,2-DIMETHYL-PROPANE-1,3-DICARBOXYLIC ACID DERIVATIVES

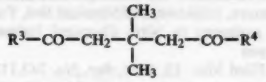
Fritz Maurer, Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,297
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923775
Int. Cl.³ C07C *67/307, 51/58, 51/60*
U.S. Cl. 560—192 **8 Claims**

1. In the preparation of a 1,3-dibromo-2,2-dimethyl-propane-1,3-dicarboxylic acid derivative of the formula



in which R^1 and R^2 each independently is chlorine or alkoxy, by reacting a 2,2-dimethyl-propane-1,3-dicarboxylic acid derivative of the formula



in which

R^3 is hydroxy or alkoxy and

R^4 is hydroxy,

with an acid halide, then reacting the product with bromine at a temperature between 0° and 150° C. to form a 1,3-dibromo-2,2-dimethyl-propane-1,3-dicarboxylic acid chloride and optionally reacting such acid chloride with an alkanol, the improvement which comprises employing as the acid halide phosphorus oxychloride, phosphorus trichloride, thionyl chloride or phosgene.

4,321,409
PROCESS FOR PRODUCING CONJUGATED DIENE MONOESTERS

Yoshinori Yoshida, and Hironobu Shinohara, both of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 103,477
Claims priority, application Japan, Jan. 17, 1979, 54-2916
Int. Cl.³ C07C *67/055*
U.S. Cl. 560—244 **22 Claims**

1. In a process for producing a conjugated diene monoester by reacting a gaseous mixture comprising, as the reactive components, a conjugated diene, a carboxylic acid and oxygen in the gas phase in the presence of a catalyst, the improvement which comprises carrying out the reaction in the presence of a catalyst prepared by supporting on a carrier (a) a palladium compound and (b) a compound or element of at least one member selected from the group consisting of magnesium, calcium, barium, cerium, lanthanum, tungsten copper, zinc, cadmium, boron, thallium, molybdenum, tin, lead, phosphorous, arsenic and selenium, reducing the so-supported components, and then adding thereto (c) at least one alkali metal carboxylate and (d) at least one alkali metal halide in an amount of 0.05 to 5 moles per 100 g of the carrier.

4,321,410
METHOD OF STRIPPING UNREACTED MATERIALS IN UREA SYNTHESIS PROCESS

Hiroshi Ono, Fujisawa; Hidetsugu Fujii, Mobara; Haruyuki Morikawa, Funabashi, and Akito Fukui, Inba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc. and Toyo Engineering Corporation, both of Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 240,170
Claims priority, application Japan, Mar. 13, 1980, 55-030893
Int. Cl.³ C07C *126/02*
U.S. Cl. 564—67 **6 Claims**

1. In a method of stripping unreacted materials in a urea synthesis process comprising subjecting a urea synthesis effluent obtained by reacting ammonia with carbon dioxide to a stripping step in which the urea synthesis effluent is brought into countercurrent contact with carbon dioxide under heating to obtain an aqueous urea solution containing a small amount of ammonia and ammonium carbamate, the improvement comprising first bringing said urea synthesis effluent into contact

with a separated gas, evolved in the stripping step, under adiabatic conditions or with cooling prior to the stripping step.

4,321,411

PROCESS FOR PRODUCING N-SUBSTITUTED ACRYLAMIDE OR METHACRYLAMIDE

Tomio Nakamura, Ichikawa, and Shunichi Doi, Yokohama, both of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,112
Claims priority, application Japan, Mar. 12, 1980, 55-30276
Int. Cl.³ C07C *102/06*
U.S. Cl. 564—135 11 Claims

1. A process for producing N-substituted acrylamide or methacrylamide comprising reacting an acrylic or methacrylic acid ester with aliphatic and/or aromatic amine in liquid medium in the presence of a catalytic amount of alkyltin alkoxide.

4,321,412

PREPARATION OF AROMATIC ALDEHYDES BY THE SOMMELET REACTION

Werner Schoch, Eschelbronn; Michael Kroener, Mannheim, and Rudi Widder, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 15, 1980, Ser. No. 197,159
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942894
Int. Cl.³ C07C *45/00, 45/42, 45/43*
U.S. Cl. 568—436 2 Claims

1. In a process for the preparation of aromatic monoaldehydes by reacting methylaromatics, which are monochlorinated in a methyl group, with hexamethylenetetramine by a Sommelet reaction, subjecting the reaction mixture to acid hydrolysis and separating off the monoaldehydes formed, the improvement that in place of pure monochlorinated methylaromatics a crude chlorination mixture which has been produced by photochlorination of methylaromatics with less than the stoichiometric amount of chlorine required for the formation of monochlorination products is employed, this mixture is treated with hexamethylenetetramine, and the Sommelet reaction is then carried out with addition of water, with the proviso that the steps of treating the mixture with hexamethylenetetramine and carrying out the Sommelet reaction take place in a single vessel without isolation of an intermediate product.

4,321,413

PRODUCTION OF ETHYLENE GLYCOL DIALKYL ETHERS USING DIALKYL ETHERS

Steven H. Vanderpool, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 30, 1981, Ser. No. 229,821
Int. Cl.³ C07C *41/41*
U.S. Cl. 568—672 9 Claims

1. A method for the production of ethylene glycol dialkyl ethers of the formula $ROCH_2CH_2OR$, where R is a lower alkyl radical, comprising reacting a dialkyl ether of the formula ROR with an ethylene glycol monoalkyl ether of the formula $ROCH_2CH_2OH$, where R is defined as above, over a heterogeneous anionic ion exchange resin catalyst.

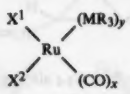
4,321,414

CATALYTIC HYDROGENATION OF GLYCOLALDEHYDE TO PRODUCE ETHYLENE GLYCOL

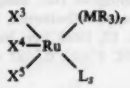
Lawrence C. Costa, Nanuet, N.Y., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Aug. 26, 1980, Ser. No. 181,493
Int. Cl.³ C07C *31/20*
U.S. Cl. 568—862 11 Claims

1. A process for the hydrogenation of glycolaldehyde to form ethylene glycol which comprises contacting glycolaldehyde with hydrogen (a) in the presence of a liquid reaction medium in which there is dissolved at least one catalyst comprising a member selected from the group consisting of (i) ruthenium complexes of the formula:



wherein x is an integer of 0 to 2, y is 2 or 3, M is P or As, R is aryl, X^1 is hydrogen, halide or pseudohalide, and X^2 is halide or pseudohalide, with the proviso $(x)^2+(y)^2$ is an integer of from 8 to 10, and (ii) ruthenium complexes of the formula:



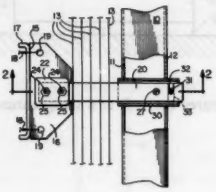
wherein M and R are as defined above, X^3, X^4 and X^5 are the same or different and are halide or pseudohalide, r is 2 or 3, s is 0 or 1, with the proviso that r must be 3 when s is 0, and L is an organic monodentate ligand, and (b) in the additional presence of at least one promoter selected from the group consisting of compounds which are stronger bases than glycolaldehyde as evidenced by a base association constant ("K_b") for said promoter at 25° C. which is greater than that for glycolaldehyde at 25° C.

4,321,415

HEATING ELEMENT SUPPORT FOR VACUUM ELECTRIC FURNACES

Robert A. Christian, Willow Grove, and Edward N. Cyrway, Jr., Levittown, both of, PA, assignors to Abar Corporation, Feasterville, Pa.

Filed Aug. 18, 1980, Ser. No. 178,860
Int. Cl.³ F27B 5/14; H05B 3/06
U.S. Cl. 13—25 10 Claims



1. A support for a heating element for a vacuum electric furnace which comprises

a tubular sleeve in said furnace having an abutment therein,

supporting members for the heating element comprising spaced strips for partial insertion in said sleeve,

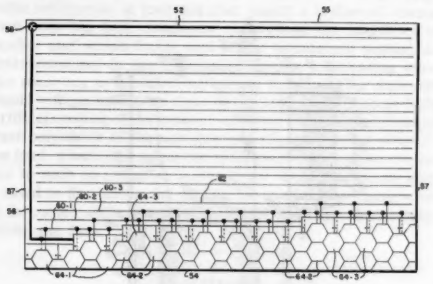
said strips having portions for engagement with said abutment in one position and for disengagement in another position.

4,321,416

PHOTOVOLTAIC POWER GENERATION

Robert J. Tennant, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1980, Ser. No. 216,726
Int. Cl.³ H01L 31/04
U.S. Cl. 136—244 17 Claims



1. A photovoltaic module of the type which is in the form of a roof shingle comprising an active portion and an inactive portion, said active portion having photovoltaic cells thereon, said inactive portion partially surrounding said active portion whereby a multiplicity of said shingles can be installed on a roof with said inactive portions overlapping, with said active portions exposed, and with said active portions connected to each other in accordance with a predetermined circuit arrangement thereby to provide a photovoltaic generating unit on said roof, said shingle being characterized in that:

said active portion has a positive lead and a negative lead extending therefrom, each of said leads comprising a flat flexible ribbon-like conductor encased in flexible insulating films, said leads having free ends which are intended for connection to conductors in said circuit arrangement,

each of said leads having a length which is greater than the length required to connect said leads into said circuit arrangement by an amount which will provide a slack servicing loop between said active portion and said free ends whereby,

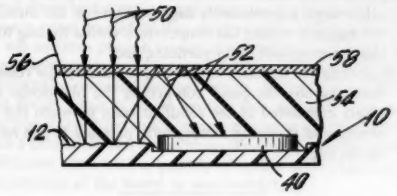
after installation of a multiplicity of said shingles on a roof as an array, an individual shingle can be removed from said array without disconnecting said free ends from said circuit arrangement by moving said individual shingle from said array with accompanying straightening of said servicing loop.

4,321,417

SOLAR CELL MODULES

William T. Kurth, Beverly Farms, and William B. Andrulitis, Manchester, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 30, 1978, Ser. No. 920,693
Int. Cl.³ H01L 31/04
U.S. Cl. 136—246 9 Claims



1. A solar cell module comprising:

an electrically nonconductive light transparent support structure having a top surface and a bottom surface;

a plurality of solar cells arrayed on and bonded to the bottom surface of said support structure;

land areas between said arrayed solar cells having roughened white light scattering surfaces selected from plastic films and paint, said light scattering surfaces having a light reflective specular component of less than about 5% as determined by goniophotometry;

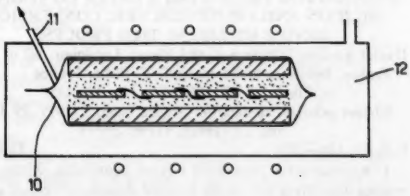
a light transparent optical medium coupled to said solar cells, said support and said light scattering surfaces whereby light impinging on said light scattering surfaces of said land areas is diffused upwardly through said optical medium and forms an angle at the top surface of said support structure which is greater than the critical angle whereby said diffused light is internally reflected downwardly toward said solar cells.

4,321,418

PROCESS FOR MANUFACTURE OF SOLAR PHOTOCELL PANELS AND PANELS OBTAINED THEREBY

Maurice Dran, Paris; Daniel Dages, Les Mureaux, and Serge Le Gravier, Orleans, all of France, assignors to Saint Gobain Vitrage, Neuilly-sur-Seine, France

Filed May 8, 1980, Ser. No. 147,921
Claims priority, application France, May 8, 1979, 79 11631; Mar. 25, 1980, 80 06568
Int. Cl.³ H01L 31/04, 31/18; B29G 6/00
U.S. Cl. 136—251 11 Claims



1. A process for producing a panel of a plurality of electri-

cally connected photocells wherein each photocell has a lower face, a side face and a radiation receiving face, said process comprising:

(a) embedding at least the lower faces and side faces of the photocells and their electrical connectors in a thermoplastic resin in particulate form, said resin becoming transparent upon fusion;

(b) enclosing the photocells embedded in step (a) between two rigid sheets to form a sandwich-type assembly, with at least the rigid sheet enclosing the receiving faces of the photocells being optically transparent;

(c) disposing the stacked assembly formed in step (b) within a flexible bag;

(d) subjecting the interior of the flexible bag to a vacuum while applying relatively high pressure to the outside of the bag, and raising the temperature within the bag to fuse the thermoplastic resin particles; and

(e) cooling the contents of the bag to solidify the resin and form thereby the panel comprising the photocells adhesively embedded in the solidfied resin between the rigid sheets, and restoring atmospheric pressure to the interior of the bag.

4,321,419

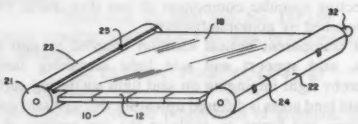
SOLAR PANEL COVER ASSEMBLY

Maurice C. Hanafin, 378 Rockgreen Pl., Santa Rosa, Calif. 95405

Continuation of Ser. No. 875,986, Feb. 8, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,116

Int. Cl.³ H01L *31/04*; F24J *3/02*

U.S. Cl. 136—251 **11 Claims**



1. In a solar panel assembly of the type including a solar panel having an upper surface for receiving solar radiation, the improvement comprising: first and second rollers disposed on opposite sides of said solar panel, a supply of film material in the form of a closed loop extending over said upper surface and also extending beneath said solar panel and around said rollers, said film material being transparent to radiation utilized by said solar panel, cleaning means disposed along said loop in contact with said film material for cleaning said film material, and means for moving said film material relative to said solar panel and said cleaning means thereby presenting clean film material for covering said upper surface of said solar panel.

4,321,420

PROCESS FOR PRODUCING A LAYER CONTAINING SILICON AND PHOTOELECTRIC CONVERSION DEVICE UTILIZING THIS PROCESS

Daniel Kaplan; Nicole Sol, and Pierre Landouar, all of Paris, France, assignors to Thomson-CSF, Paris, France

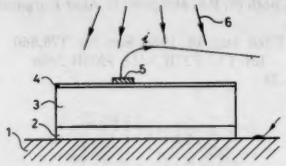
Filed Jul. 29, 1980, Ser. No. 173,431

Claims priority, application France, Aug. 3, 1979, 79 19972

Int. Cl.³ H01L *31/06, 31/18*

U.S. Cl. 136—255 **13 Claims**

1. A process for producing a layer containing silicon, comprising depositing silicon by thermal decomposition of a gaseous mixture containing silane at a temperature (T) which is between 50° C. above and 50° C. below the crystallization temperature of the deposited material, and heat treating the deposited material in a plasma containing hydrogen, hydrogen



isotopes or mixtures thereof, at a temperature below the temperature (T).

4,321,421

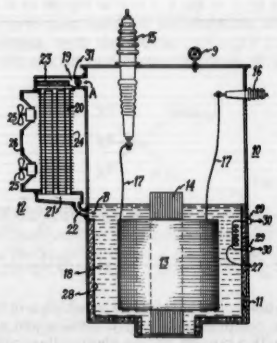
VAPORIZATION COOLED TRANSFORMER HAVING A HIGH VOLTAGE

Linden W. Pierce, Rome, Ga., assignor to General Electric Company

Filed Mar. 7, 1979, Ser. No. 18,135

Int. Cl.³ H01F *27/18*

U.S. Cl. 174—11 R **6 Claims**



1. Vaporization cooled transformer comprising:

a transformer tank containing a dielectric coolant consisting of a single fluid in liquid and vapor forms for cooling and insulating a core and winding assembly within said tank;

a heat exchanger communicating with said tank interior for receiving the dielectric coolant in vapor form and condensing the dielectric coolant for return to said tank in liquid form;

means monitoring the vapor pressure of the dielectric coolant within said tank; and

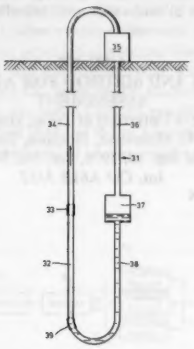
means repsonsive to said monitoring means for controlling the rate of condensation of the dielectric coolant vapor within said heat exchanger in a manner to maintain the dielectric coolant vapor pressure in said tank within a predetermined range in order to insure adequate dielectric strength of the dielectric coolant vapor.

4,321,422

BUSBAR INSTALLATION

Edward C. Rogers, Putney, and Derek R. Edwards, Windsor, both of England, assignors to BICC Limited, London, England

Continuation of Ser. No. 862,646, Dec. 20, 1977, abandoned.
This application Oct. 9, 1979, Ser. No. 82,881
Claims priority, application United Kingdom, Dec. 20, 1976, 53030/76
Int. Cl.³ H01B 7/34
U.S. Cl. 174—15 C 9 Claims



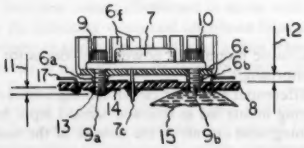
1. An electric busbar installation comprising a substantially rigid tube arranged with its axis substantially vertical, at least one busbar comprising a substantially rigid bare elongate conductor housed within and rigidly secured to and spaced from said rigid tube by longitudinally spaced rigid insulators, the space between the busbar and the tube containing an electrically insulating fluid which is in direct contact with the bare conductor of the busbar, a closed circulatory system for evaporable refrigerant, at least one duct which is in thermal association with the bare conductor throughout the length of the busbar and which forms part of the circulatory system, and interconnected in the circulatory system, condensing means for receiving evaporated refrigerant from, and for delivering liquid refrigerant to, the duct, the arrangement being such that artifical cooling of the busbar is effected by extraction from the bare conductor of the heat generated by the busbar when it is on load, which heat raises the temperature of the bare conductor to such an extent as to evaporate liquid refrigerant being caused to flow along the duct to the condensing means where it is cooled and condensed to liquid form for re-circulation along the duct.

4,321,423

HEAT SINK FASTENINGS

Philip A. Johnson, Kingston, and Alfred F. McCarthy, Belmount, both of N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

Filed May 15, 1980, Ser. No. 149,971
Int. Cl.³ H05K 7/20
U.S. Cl. 174—16 HS 4 Claims



1. Heat sink apparatus fastenable in a subassembly relationship with a packaged electronic device having an apertured heat-conducting base, for wave-soldered attachment in spaced relation to a printed-circuit board, comprising a metal heat-sink member having an apertured base adapted to fit in abutting aperture-aligned relation with the heat-conducting base of a packaged electronic device, externally-threaded elongated fastener means proportioned to fit through apertures of the base of the heat-sink member and apertures of base of a packaged electronic device and to hold the base of the heat-sink member joined togethe with and in underlying relation to such a device, said threaded fastener means projecting below said base by a predetermined distance which is not less than the thickness of a printed-circut with which it is intended to be fastened plus the further thickness of a desired spacing between said base and the top of such a printed-circuit board, spacer means in the form of integral hollow cylindrical bosses of material about said apertures and projecting below said base by a distance equal to said further thickness and disposed to rest upon top surfaces of such a printed-circuit board to effect the spacing, said bosses being internally threaded for mating with said externally-threaded fastener means, the threaded surfaces of said fastener means which project through such a printed-circuit board when the spacer means rest upon the top surfaces of such a printed-circuit board being wettable by molten solder to collct and bond with a quantity of solder upon exposure of lower surfaces of the board to wave-soldering.

4,321,424

HYDROCARBON ELECTRICAL INSULATION OIL CONTAINING TRI-CRESYL PHOSPHATE TO INCREASE WATER RETENTION CAPABILITY

John H. Olmsted, New Berlin, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Mar. 31, 1978, Ser. No. 892,315
Int. Cl.³ H01B 3/22
U.S. Cl. 174—17 LF 4 Claims

1. In an electrical apparatus comprised of an oil tank,
an electrical component in the tank having cellulosic material separating the electrical elements and a saturated hydrocarbon oil which oil is liquid throughout the temperature range of 0° C. to 40° C., the improvement comprising:
an additive consisting of tri-cresyl phosphate ester in an amount by weight of the insulating oil of 0.2 to 0.8 percent which minimizes the detrimental effects that can result from the decomposition of the cellulosic materials under operating conditions.

4,321,425

LATTICE CABLE AND COMPOSITE DIELECTRIC TRANSMISSION LINE AND METHOD OF MAKING SAME

Leroy L. Emmel, 1800 Wallace Ave., Apt. R, Costa Mesa, Calif. 92627

Filed Feb. 2, 1979, Ser. No. 8,552
Int. Cl.³ B32B 15/08; H01B 7/08, 9/00
U.S. Cl. 174—32 9 Claims

1. A flexible lattice filament cable comprising:
a pair of elongated insulative elements extending parallel to one another and uniformly spaced apart by integrally formed insulative ribs therebetween, said elongated insulative elements and said insulative ribs having a first dielectric constant, and
an elongated electrical conductor partially embedded in each of said elongated insulative element and completely embedded in said insulative ribs so that a portion of the surfaces of said electrical conductors is exposed.

6. A flexible lattice cable comprising:
a plurality of elongated insulative elements extending parallel to one another and uniformally spaced apart by integrally formed insulative ribs therebetween, said elongated insulative elements and said insulative ribs having a first dielectric constant, said insulative elements being formed as "U" shaped channels, and

an elongated electrical conductor centrally located within each of said "U" shaped insulative elements and partially embedded therein and completely embedded in said insulative ribs so that a portion of the surface of said electrical conductor is exposed.

9. A method for making a lattice cable comprising the steps of:

applying heat to a film belt of insulative material having a first dielectric constant to melt said film belt;

heating a plurality of electrical conductors to a temperature that is near to the melting temperature of said film belt;

heating a mold roll to a temperature that is near to the melting temperature of said film belts;

moving said plurality of heated electrical conductors into seated contact with circumferential grooves in the surface of said mold roll so that at least every other one of said circumferential grooves receives one of said heated electrical conductors, said electrical conductors bridging longitudinal grooves in the surface of said mold roll, said longitudinal grooves having a depth greater than said circumferential groove and crossing said circumferential grooves at spaced intervals;

moving said melted film belt into pressure contact with said molding roll surface to mold said insulative material into said circumferential grooves and into said deeper longitudinal grooves thereby forming parallel elongated insulative elements with at least every other one thereof containing an electrical conductor partially exposed therein, said parallel elongated insulative elements being interconnected at spaced intervals by integrally formed insulative ribs surrounding said electrical conductors; and

cooling said parallel elongated insulative elements and electrical conductors partially exposed therein along with said interconnecting ribs to solidify and stabilize the lattice cable structure.

4,321,426

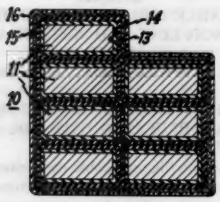
BONDED TRANSPOSED TRANSFORMER WINDING CABLE STRANDS HAVING IMPROVED SHORT CIRCUIT WITHSTAND

Friedrich K. Schaeffer, Cheshire, and Thomas F. Brennan, Dalton, both of Mass., assignors to General Electric Company

Continuation of Ser. No. 914,069, Jun. 9, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,416

Int. Cl.³ H01B *11/02*

U.S. Cl. 174—34 **4 Claims**



1. A shear resisting cable for use in forming transformer windings comprising:

a plurality of metal strands of rectangular cross-section arranged juxtaposed each other in a transposed configuration;

a layer of insulating enamel overall coating the surface of each metal strand;

a layer of adhesive material having a predetermined melting temperature, said adhesive material layer overall coating the exposed insulating enamel surfaces of the metal strands to bond the juxtaposed insulating enamel surfaces together and thus maintain the transposed configuration of the metal strands in opposition to short circuit shear forces;

a layer of insulating paper wrapped about the bonded metal strands in transposed configuration; and

a heat shrinkable tape having a shrink initiating temperature higher than the predetermined melting temperature of the adhesive material, the heat shrinkable tape wrapped about the insulating paper layer with adjacent wraps in spaced relation and being in a shrunken condition to promote the bonding together of the transposed metal strands by the adhesive material layer, the spaced relation of the tape wraps accommodating outgassing of said cable and the impregnation of said cable with transformer oil.

4,321,427

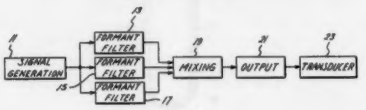
APPARATUS AND METHOD FOR AUDIOMETRIC ASSESSMENT

Sadanand Singh, c/o University of Texas, Health Science Center of Houston, 1343 Moursund, Houston, Tex. 77030

Filed Sep. 18, 1979, Ser. No. 76,608

Int. Cl.³ A61B *5/12*

U.S. Cl. 179—1 N **28 Claims**



1. Apparatus for audiometric assessment using the formant frequencies for average voices of various identifiable groups of people, comprising:

signal generation means for producing a first signal of selectably variable frequency; and

filter means for converting a first signal into a complex second signal including (1) a fundamental component of frequency equal to the frequency of the first signal and (2) at least a first harmonic term of such first signal as a speech-type synthesized vowel sound.

4,321,428

ACOUSTIC MONOLITHIC POWER SEMICONDUCTOR INTEGRATED CIRCUIT AND ACOUSTIC SYSTEM USING THE SAME

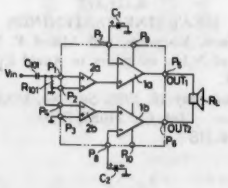
Kunio Seki, Hinode, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,765

Claims priority, application Japan, Nov. 24, 1978, 53-144199

Int. Cl.³ H03F *3/00*

U.S. Cl. 179—1 A **6 Claims**



1. An acoustic monolithic power semiconductor integrated circuit comprising:

a first differential amplifier circuit having non-inverting and inverting inputs led as first and second input terminals of said integrated circuit to the outside of the same, respectively;

a first amplifier output circuit having a non-inverting input supplied with the output signal of said first differential amplifier circuit within said integrated circuit and an inverting input led as first feedback terminal to the outside

of said integrated circuit for determining the gain and output DC level of said first amplifier output circuit, said first amplifier output circuit having its output terminal led as a first output terminal of said integrated circuit to the outside of the same, and further comprising:

a second differential amplifier circuit having non-inverting and inverting inputs led as third and fourth input terminals of said integrated circuit to the outside of the same, respectively; and

a second amplifier output circuit having a non-inverting input supplied with the output signal of the second-named differential amplifier circuit within said integrated circuit and an inverting input led as a second feedback terminal to the outside of said integrated circuit for determining the gain and output DC level of the second-named amplifier output circuit, the second-named amplifier output circuit having its output terminal led as a second output terminal of said integrated circuit to the outside of the same.

4,321,429

APPARATUS FOR SELECTING TERMINAL EQUIPMENT IN TELEPHONE LINES

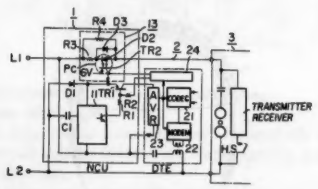
Toshiharu Takatsuki, Tokyo; Ken-ichi Fujiwara, Amagasaki; Sinobu Yanagisawa, Amagasaki, and Shigeru Okamura, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,612

Claims priority, application Japan, Oct. 20, 1978, 53-129079

Int. Cl.³ H04M *11/06*

U.S. Cl. 179—2 DP **4 Claims**



1. In an apparatus for selectively granting priority use of telephone lines to a telephone or a data transmitter each connected via said telephone lines at the same line terminals to an exchange center, the improvement comprising:

current detection means connected in series with said telephone for detecting when said telephone lines are providing current to said telephone during a time when said data transmitter is transmitting or receiving data via said telephone lines; and

control circuit means coupled to said current detection means for stopping the application of power to said data transmitter upon detection of a current component on said telephone lines to said telephone by said current detection means;

whereby priority use of said telephone lines is granted to said telephone whenever telephone current is detected.

4,321,430

SUBSCRIBER'S CONNECTING NETWORK COMPRISING A SYMMETRICAL POWER AMPLIFIER FOR FEEDING A SUBSCRIBER'S LINE

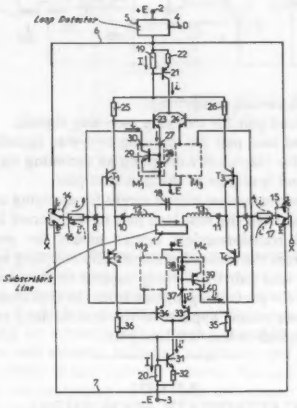
Gilbert M. M. Ferrieu, Paris, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Continuation of Ser. No. 26,103, Apr. 2, 1979, abandoned. This application Aug. 6, 1980, Ser. No. 175,810

Claims priority, application France, Apr. 3, 1978, 78 09743

Int. Cl.³ H04M *3/22, 19/00*

U.S. Cl. 179—18 FA **7 Claims**

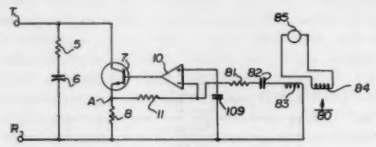


1. A subscriber's connecting network comprising a symmetrical power amplifier having two pairs of transistors, the transistors of each being being of complementary types, the bases and emitters of each pair of transistors being interconnected and forming two input and two output terminals, respectively, of the symmetrical amplifier, first means for coupling the collectors of the transistors of one type to a first terminal of a d.c. voltage source and second means for coupling the collectors of the transistors of the other type to a second terminal of the d.c. voltage source, means for connecting the output terminals to the terminals of a subscriber's line and means for coupling each of the two input terminals to a respective one of the terminals of the d.c. voltage source via an input impedance, said first and second coupling means each including a resistor for limiting the current in the subscriber's line, said resistors being identical, means for making the base voltages of the transistors dependent on the collector voltages thereof, said last-named means including means, coupled to each resistor, for supplying a current i which is proportional to the current through the respective resistor, a pair of current mirrors each having an input and an output terminal, means, coupled to each of said current supply means, for applying the respective current i to an input terminal of a respective one of said pair of mirrors and means for connecting said output terminal of each mirror to a respective one of said two input terminals of said amplifier.

4,321,431
TRUNK CIRCUIT WITH SINGLE COUPLING TRANSFORMER

Patrick R. Beirne, Stittsville; Michael C. J. Cowpland, Ottawa, and Raymond J. Whitbread, Ashton, all of Canada, assignors to Mitel Corporation, Ontario, Canada

Continuation-in-part of Ser. No. 925,297, Jul. 17, 1978, Pat. No. 4,182,936. This application Aug. 23, 1979, Ser. No. 69,054
Claims priority, application Canada, Feb. 28, 1978, 297883
The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.
Int. Cl.³ H04M *7/04*
U.S. Cl. 179—18 AH **24 Claims**

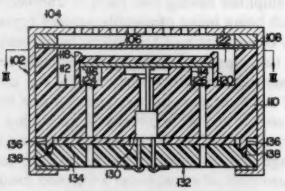


14. A trunk circuit comprising:
(a) a first lead pair for carrying two-way signals,
(b) a second lead pair for carrying two-way signals,
(c) means for electrically coupling an incoming signal from the second lead pair to the first lead pair,
(d) first transformerless circuit means for applying an incoming signal from the first lead pair to the second lead pair,
(e) second transformerless circuit means for preventing signals from the means for electrically coupling applied to the first lead pair from being applied to the second lead pair and for preventing signals from the first transformerless circuit means applied to the second lead pair from being applied to the first lead pair.

4,321,432
ELECTROSTATIC MICROPHONE

Hideki Matsutani, and Hiroto Wada, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 17, 1979, Ser. No. 104,066
Claims priority, application Japan, Dec. 23, 1978, 53/160711; Dec. 23, 1978, 53/160719
Int. Cl.³ H04R *19/04*
U.S. Cl. 179—111 R **21 Claims**



1. An electrostatic microphone comprising:
an electrically conductive diaphragm,
a stationary electrode plate,
a supporting member including a central projection upon which said stationary electrode plate is mounted, at least a pair of resilient supporting members which are disposed on opposite sides of said stationary electrode plate for holding the same in cooperation with said central projection, and an annular projection surrounding said central projection and adapted to support said electrically conductive diaphragm, said central and annular projections defining an air chamber communicated with an air gap between said electrically conductive diaphragm and said stationary electrode plate at the peripheral portion of said air gap.

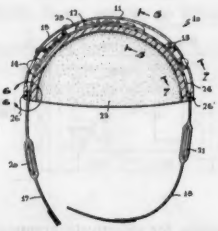
18. An electrostatic microphone comprising:
an electrically conductive diaphragm;
a stationary electrode plate;
a supporting member for supporting said diaphragm substantially in parallel with said stationary electrode plate; and
means for defining an air chamber communicated with an air gap between said vibrating diaphragm and said stationary electrode plate at the peripheral portion of said air gap;
a circuit device having a housing integrally molded with said supporting member and including a field effect transistor impedance converting means having a gate electrode with its end shaped wavy for resiliently engaging said stationary electrode plate, for converting a high impedance of a capacitor constituted by said diaphragm and said stationary electrode plate into a lower impedance.

21. An electrostatic microphone comprising:
an electrically conductive diaphragm;
a stationary electrode plate;
a supporting member for supporting said diaphragm substantially in parallel with said stationary electrode plate, said supporting member provided with a recess;
means for defining an air chamber communicated with an air gap between said vibrating diaphragm and said stationary electrode plate at the peripheral portion of said air gap; and
a circuit device taking the form of a frustum and received within said recess of said supporting member which is tapered to receive said circuit device, said circuit device including an impedance converting means which is electrically connected to said stationary electrode plate for converting a high impedance of a capacitor constituted by said diaphragm and said stationary electrode plate into a low impedance.

4,321,433
WATERPROOF HELMET ENCASING ELECTRONIC COMPONENTS

Frederick T. King, 324 16th St., #F, Huntington Beach, Calif. 92648

Filed Feb. 8, 1980, Ser. No. 119,998
Int. Cl.³ A42B *3/00*; H04R *1/02*
U.S. Cl. 179—156 R **4 Claims**



1. A protective waterproof helmet comprising:
a liner of soft, pliable material adapted to fit the head of the user;
an intermediate shell lying adjacent to and covering said liner;
an outer protective shell of hard material lying adjacent to and covering said intermediate shell;
detachable interlocking means carried along adjacent edge marginal regions of said outer shell and said intermediate shell adapted to join together to form a unitary construction so as to define a waterproof seal therebetween and to define a cavity between said outer shell surface depression and the opposing surface of said intermediate shell;
electronic components operably carried on said intermediate

shell occupying said cavity between said outer and said intermediate shells;

strap means attached to said outer shell adapted to encircle the chin of the user to retain said unitary construction on the head of the user;

earphones for operable coupling to said electronic components and sealed in said strap means so as to be adjacent the ears of the user;

a rigid platform carried on said intermediate shell at the crown thereof for mounting said electronic components thereon;

a visor detachably carried on the front of said outer shell so as to extend outwardly therefrom between opposite ends of said strap means; and

a sealing means carried on said outer shell immediately adjacent said interlocking means and engagable with said intermediate shell to effect a waterproof seal therewith.

4,321,434

ELECTROACOUSTIC TRANSDUCER

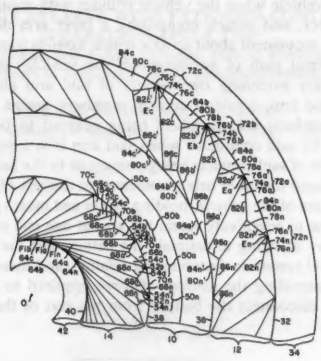
Hideyuki Irie, Yokohamashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 24, 1980, Ser. No. 162,642

Claims priority, application Japan, Jul. 13, 1979, 54-088742

Int. Cl.³ H04R *7/20*

U.S. Cl. 179—181 R **9 Claims**



1. An electroacoustic transducer comprising:

an annular diaphragm;

an outer edge and an inner edge each respectively adjacent the outside and the inside of the diaphragm for suspending the diaphragm;

an outer fixing area adjacent the outside of the outer edge for fixing the diaphragm to an outer supporting member;

an inner fixing area adjacent the inside of the inner edge for fixing the diaphragm to an inner supporting member; first and second sets of pleats arranged continuously along the circumferential directions of the outer and inner edges of the diaphragm, but directed in opposite directions to each other, each pleat in the outer edge including a bottom line extending from a first boundary between the outer fixing area and the outer edge to a second boundary between the outer edge and the diaphragm; wherein the point of intersection of each bottom line in the outer edge with the first boundary determines a tangent to the second boundary and wherein a radius of an annular diaphragm passing through the intersection of any bottom line with the second boundary lies between a radius passing through the intersection of that bottom line with first boundary and a radius through the point of tangency.

4,321,435

FLUID ACTUATING DEVICE FOR AN ELECTRIC CIRCUIT BREAKER

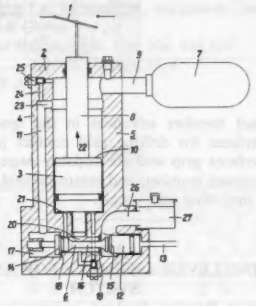
Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 375,745, Jul. 2, 1973, abandoned. This application Sep. 1, 1977, Ser. No. 829,790

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1972, 2234811

Int. Cl.³ F15B *13/04, 15/17;* **H01H** *35/38*

U.S. Cl. 200—82 B **8 Claims**



1. Fluid actuating device for an electric switching apparatus such as a high-voltage power circuit breaker or the like, said switching apparatus comprising first and second contacts at least one of which is movable and said fluid actuating device comprising an actuator for actuating the electric switching apparatus; said actuator including a cylinder, and a differential piston movable in said cylinder between first and second end-positions corresponding to the open and closed positions of said first and second contacts, said differential piston having two end-faces for receiving fluid pressure force; one of said two end-faces having a surface area greater than the other one of said two end-faces, high-pressure supply means for supplying fluid to said two end-faces; valve means for alternately interrupting and passing the fluid from said fluid supply means to said one end-face whereby said differential piston is caused to move from said first end-position to said second end-position when said valve means passes fluid to act upon said one end-face, means for reducing the volumetric flow-rate of the fluid supplied to said one end-face to a predetermined level in the course of the movement of said differential piston to said second end-position from said first end-position and before said second end-position is reached so as to cause the fluid to be continuously supplied to said one end-face at said predetermined level at the pressure of said high-pressure supply means until said end-position is reached and means for coupling said differential piston to said movable contact so as to cause said movable contact to move from a position whereat said first and second contacts are open to a position whereat said first and second contacts are closed as said piston moves from said first end-position to said second end-position.

4,321,436

ELECTRICAL CIRCUIT INTERRUPTORS

Richard V. McGarrity, Drexel Hill, Pa., assignor to Federal Pacific Electric Company, Newark, N.J.

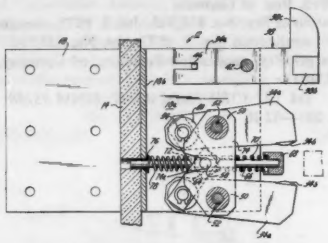
Filed Apr. 4, 1980, Ser. No. 137,232

Int. Cl.³ H01H *31/00*

U.S. Cl. 200—48 KB **7 Claims**

1. An electrical circuit making and breaking device including stationary contact means, movable contact means including a main movable contact member, means for operating the movable contact means into and out of cooperation with the

stationary contact means, said stationary contact means including a pair of main contact jaws having respective pivots bearing contact surfaces that are opposite each other but spaced apart, a toggle operable toward an erect condition as the mov-



able contact member advances in the space between said contact surfaces for driving said contact jaws so that said contact surfaces grip and are slidably engaged by the main movable contact member, and means on said movable contact means for operating said toggle.

4,321,437

OPERATING LEVER ASSEMBLY FOR AN ELECTRICAL SWITCH

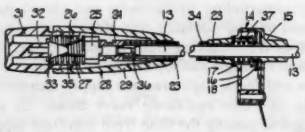
Edward Cryer, Burnley, England, assignor to Lucas Industries Ltd., Birmingham, England

Filed Aug. 11, 1980, Ser. No. 177,100

Claims priority, application United Kingdom, Aug. 16, 1979, 28501/79

Int. Cl.³ H01H *3/12, 21/00*

U.S. Cl. 200—61.54 **6 Claims**



1. An operating lever assembly for a switch mechanism comprising a lever arranged at one end for connection in the switch mechanism whereby bodily movement of the lever relative to the switch mechanism operates the mechanism, a rotary switch carried by said lever and positioned intermediate the ends of the lever, the rotary switch comprising a base secured to the lever, a rotor rotatable relative to said base and said lever, a fixed switch contact, and a movable switch contact, said switch contacts being operable by angular movement of the rotor relative to the base about the longitudinal axis of the lever, a drive sleeve within which said lever extends, said drive sleeve being rotatable relative to the lever about the longitudinal axis of the lever and being connected at one end to said rotor of said rotary switch, a hollow operating member coupled to the end of said drive sleeve remote from said rotor of said rotary switch, said operating member being coupled to said drive sleeve in a non-rotatable manner, but being capable of movement relative to the drive sleeve longitudinally of the drive sleeve, and, a push action switch mechanism housed within said operating member, said push action switch mechanism including a body fixed against movement in the longitudinal direction of the drive sleeve, a fixed switch contact, and a movable switch contact, said push action switch mechanism contacts being operable by movement of said operating member relative to said body and said drive sleeve in the longitudinal direction of the drive sleeve, whereby, rotational movement of said operating member relative to said lever about the longitudinal axis of said lever rotates said drive sleeve and thus said rotor of said rotary switch relative to said lever and to the base of said rotary switch to operate said rotary switch contacts, whereas longitudinal movement of said operating member relative to said drive sleeve and said lever causes said operation of said push action switch contacts.

4,321,438

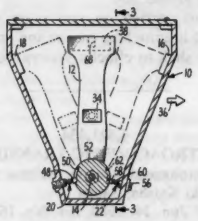
SAFETY SWITCH FOR VEHICLE ELECTRICAL SYSTEM

Ray Emenegger, 19 Coronado Cir., Santa Rosa, Calif. 95405

Filed Jun. 23, 1980, Ser. No. 161,927

Int. Cl.³ H01H *35/00*

U.S. Cl. 200—61.45 R **4 Claims**



1. A collision-responsive safety switch for a vehicle operable to disconnect the battery from the rest of the electrical system of the vehicle when the vehicle collides with another vehicle or object, said switch comprising a lever arm disposed for pivotal movement about an axis which extends transversely of the normal path of movement of the vehicle, an electrical conductor extending transversely of said arm and movable with said arm, a pair of contact members, means supporting said members, said members being adapted to be interconnected by said conductor when said arm is in a vertical position, one of said contacts being connected to the battery of the vehicle and the other being connected to the rest of the electrical system of the vehicle, holding means and means positioning the same to selectively retain the arm at one end or the other of its arc of swing to maintain the battery and the rest of the electrical system in disconnected relation, and means for variably controlling the amount of force required to swing said arm to disconnect the battery from the rest of the electrical system.

4,321,439

ELECTRICAL CONTACT CONSTRUCTION FOR AIR-BLAST CIRCUIT BREAKERS

Rüdiger Hess, and Heiner Marin, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,122

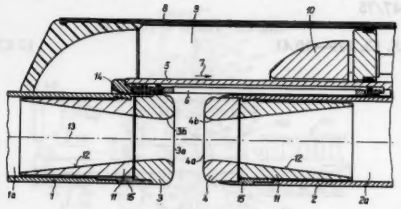
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847808

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 A **4 Claims**

1. In an air-blast circuit breaker including axially disposed tubular electrical contacts between which an arc is conducted during interruption of a current flow through the breaker, said arc being blasted by a stream of compressed gas and said tubular contacts having nozzle members disposed on opposing end faces thereof, said nozzle members each including a nozzle opening having a contour which is flared outwardly from the end faces thereof, said breaker further including a tubular member fabricated of ferromagnetic material disposed concentrically within each of said contacts and spaced apart from the inner surface thereof, the improvement comprising said tubular member including a radially inner surface having a conically-

shaped contour which is matched to said contour of said nozzle opening of each of said nozzle members so that said contour of



said nozzle opening is continued by said inner surface contour of said tubular member.

4,321,440

CIRCUIT BREAKER WITH EXTENDED CONTACT SEPARATION AFTER TRIP

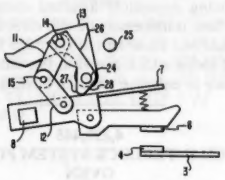
Kouhei Fujiwara, and Setsuo Hosogai, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1981, Ser. No. 235,369

Claims priority, application Japan, Feb. 19, 1980, 55/19865[U]

Int. Cl.³ H01H 7/16

U.S. Cl. 200—153 G **4 Claims**



1. A circuit breaker, comprising:

a fixed contact;

movable contact means;

a movable contact supported upon said movable contact means;

an operating handle;

a rotatable cradle movable between latched and tripped position;

releasable latch means for latching said cradle in the latched position and operable upon overcurrent conditions to release said cradle;

a toggle linkage connected between said cradle and said movable contact means and operable between extended and collapsed position to move said movable contact means between open and closed positions;

an operating spring connected between said handle and said toggle linkage for extending and collapsing said toggle linkage in response to operation of said handle; and

arm stop means having a flat portion and an extended portion for limiting travel of said movable contact means when said circuit breaker is operated to the open circuit position, said arm stop means being connected to said cradle and contacting said movable contact means with said extended portion when said cradle is in the latched position, and contacting said movable arm means with said flat portion when said cradle is in the released position; whereby the contact separation distance is greater when said circuit breaker is in the open position due to an overcurrent condition than when due to a handle operation.

4,321,441

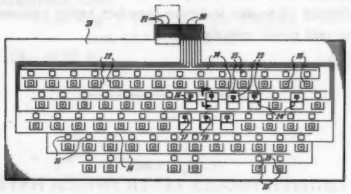
KEYSWITCH ARRANGEMENT

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 4, 1980, Ser. No. 118,126

Int. Cl.³ H01H 3/14

U.S. Cl. 200—159 A **9 Claims**



1. A keyswitch arrangement including a substrate on which a plurality of switch elements are formed, said switch arrangement characterized in that

said substrate is a flexible dielectric material;

each of said switch elements comprises stationary conductive contact means and movable conductive contactor means, each of said conductive means being positioned adjacent one another on one side of said substrate; and

said substrate is provided with incised portions around each of said movable contactor means to form flaps, each carrying one of said contactor means, said substrate further having nonincised hinges integral therewith associated with each flap, so that each of said hinges is located between each of said contact means and its related movable contactor means to allow said switch elements to lie in confronting relationship with one another, each of said flaps having been passed through and beyond the region of elastic deformation and into the region of plastic deformation of said substrate material and disposed at an acute angle to the plane of said substrate when in its operative open switch orientation.

4,321,442

SMALL-SIZED SWITCH WITH INDICATOR

Yukihisa Tanaka, and Shigeo Ohashi, both of Tokyo, Japan, assignors to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Japan

Filed Jul. 8, 1980, Ser. No. 167,187

Claims priority, application Japan, Oct. 19, 1979, 54-143994[U]

Int. Cl.³ H01H 9/16

U.S. Cl. 200—308 **12 Claims**

1. A small-sized switch with indicator comprising:

a housing having at least one open end;

a main contact accomodated in said housing;

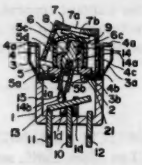
a cover member attached to the open end of said housing;

a movable lever disposed in said housing, one end of said movable lever being located in said housing while the other end projecting out of said cover member;

a converter provided at one end of said movable lever and adapted for opening and closing said main contact;

a switch actuator tiltably mounted on said cover member and having an internal cavity, said switch actuator further

having a window through which a space inside said internal cavity is observed and a bridge member disposed in said internal cavity, said bridge member being connected to the other end of said movable lever; and



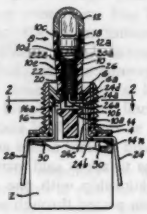
a substantially U-shaped plate-like indicate member mounted in said internal cavity of said switch actuator so as to saddle over said bridge member, free ends of said U-shaped plate-like indicate member being releasably fixed to said cover member.

4,321,443

LIGHTED TOGGLE LEVER SWITCH HAVING ARTICULATED CONDUCTORS

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 25, 1980, Ser. No. 181,013
Int. Cl.³ H01H 9/16
U.S. Cl. 200—315 **10 Claims**



1. In a switch having a housing including a base enclosing contacts and a cover over said base with a bushing extending up from said cover, the combination comprising:

a toggle lever extending through said bushing and having an internal lower end portion for actuating said contacts and an external upper end portion for manual operation by the user;

means pivotally supporting said toggle lever in said bushing comprising;

a lateral hole through the middle portion of said toggle lever; and

a pair of insulating cover and bushing liner halves straddling said toggle lever and each having a trunnion extending into the corresponding end of said lateral hole to pivot said toggle lever thereon;

said combination also comprising:

a light source in the external end of said toggle lever;

a longitudinal hole extending from said lateral hole to said light source;

and articulated electrical connection means from said light source through said longitudinal hole, said lateral hole, said trunnions and said insulating liner halves to external terminal portions.

4,321,444

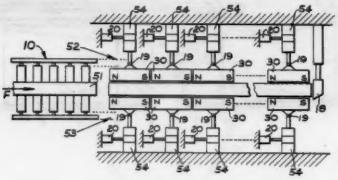
INDUCTION HEATING APPARATUS

Evan J. Davies, Little Aston, England

Continuation-in-part of Ser. No. 774,242, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 643,808, Dec. 23, 1975, abandoned. This application Oct. 23, 1978, Ser. No. 953,903

Claims priority, application United Kingdom, May 21, 1975, 8847/75

Int. Cl.³ H05B 6/10, 6/36
U.S. Cl. 219—10.41 **12 Claims**



1. An induction heating apparatus comprising first and second spaced apart magnetically permeable core structures having faces which have a series of generally parallel slots therein, said faces confronting one another and bounding a gap into which a metal slab not less than about 20 mm. thick to be heated can be introduced with its major faces each opposing a respective slotted face of said core structures, the slots of the face of each core structure being wound with a respective set of linearly distributed electrically conductive coils connectible to different phases of a mains frequency polyphase supply whereby travelling wave magnetic fields are produced by said coils which travel along said gap in the same direction generally parallel to the respective slotted faces and transverse to said slots so as to react with said faces of the slab, the surface layers of which afford continuous flux paths, lengthwise of said gap, for said fields, the two sets of coils being wound with like poles substantially in opposition whereby the transverse component of magnetic flux derived from each set of coils is substantially in opposition to that derived from the other set thereby inducing oppositely directed currents in said major faces which flow transversely of said direction of travel of the magnetic fields and close across the edge faces of the slab to form current loops which travel in the same direction as said magnetic fields to enhance uniform heating of the slab.

4,321,445

DOOR LATCH INTERLOCK SYSTEM FOR MICROWAVE OVEN

Mark J. Kristof, and John R. Schwaderer, both of Marion, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 28, 1980, Ser. No. 117,796
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 C **18 Claims**

1. In a microwave oven having a cabinet defining an oven cavity provided with an opening, a closure movably mounted to said cabinet for movement between a closed position closing said opening and an open position providing access to said opening, electrically operable microwave energy generating means for supplying microwave energy to said cavity, and an electrical circuit including switch means for controlling delivery of electric power from an external source to said generating means, improved means for selectively securing said closure in a closed position wherein the closure sealingly closes said opening automatically as an incident of the closure being moved to said closed position comprising:

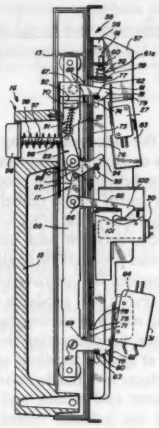
a slider member movably mounted to said cabinet for movement between released and latching positions;

catch means movable with said slider member;

means for biasing said slider member toward the latching position at all times;

latch means carried by said closure and engageable with said catch means for automatically latching said closure in the closed position as an incident of said closure being moved to said closed position with said slider member being disposed in said latching position;

actuator means for operating said switch means to permit operation of said generating means only when said closure is latched in said closed position; and



manually operable means for arranging said actuator means to cause said switch means to prevent operation of the generating means and concurrently move said slider member to said released position for unlatching said closure while in said closed position and thereby permitting said unlatched closure to be moved selectively from said closed position to said open position.

4,321,446

APPARATUS FOR PRODUCTION OF GRAPHITE FIBERS

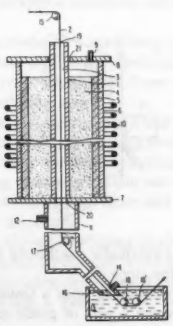
Hiroyasu Ogawa; Kazuo Nonaka, and Hiroto Noda, all of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,181

Claims priority, application Japan, Aug. 21, 1979, 54-106505

Int. Cl.³ H05B *6/26;* **D01F** *9/12*

U.S. Cl. 219—10.49 R **7 Claims**



1. A vertical heating apparatus for production of graphite fibers from preoxidized fibers or carbon fibers, said apparatus comprising:

a tubular heating element which generates heat by high frequency induction;

a heat-insulating material layer provided around the tubular heating element in coaxial relation thereto, said heat-insulating material layer being composed of carbon particles having an average grain diameter of from about 0.5 to 1.5 mm and an angle of repose of 35° or less, said particles being obtained by granulating carbon black powder having an average grain diameter of from about 50 to 300 mμ with a carbonizable binder and carbonizing the binder; and

a high frequency induction unit provided around the heat-insulating material layer in coaxial relation thereto;

said tubular heating element being provided at an upper portion thereof with a fiber introduction inlet and a gas discharge outlet, and at a lower portion thereof with a fiber withdrawal outlet and an inert gas introduction inlet.

4,321,447

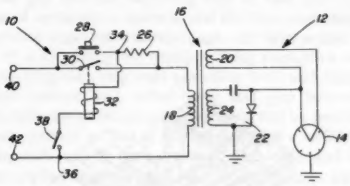
ENERGIZATION CIRCUIT FOR A MICROWAVE OVEN

John T. Lamb, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Aug. 7, 1980, Ser. No. 176,192

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **4 Claims**



1. An energization circuit for a microwave oven in which high frequency energy is emitted by a high frequency generator, comprising first and second parallel circuit portions for connecting a source of electrical energy to the generator, said first circuit portion including a first normally open switch and a current limiting PTC thermistor coupled in series relation and said second circuit portion including a second normally open switch, actuator means upon energization thereof for closing said second switch in delayed response to such energization, and circuit means connected to said first circuit portion between said first switch and said PTC thermistor for energizing said actuator means directly with current flow through said first switch upon closure of said first normally open switch to close said second switch and then with current flow in the opposite sense through said PTC thermistor upon opening of said first switch and the closing of said second switch.

4,321,448

METHOD OF AND APPARATUS FOR WELDING METAL BARS

Kaoru Shiozawa, and Tsunebumi Matsunaga, both of Ichihara, Japan, assignors to Kajima Corporation and Mitsui Engineering & Shipbuilding Co., Ltd., both of Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,075

Claims priority, application Japan, Jul. 11, 1979, 54-87686

Int. Cl.³ B23K *9/225, 37/06*

U.S. Cl. 219—57 **4 Claims**

1. A method of welding metal bars (**1**) and (**1**) together, comprising the sequential steps of:

projecting a spacer pin (**29**) at a prescribed point in a path through which metal bars (**1** and **1**) to be welded together are transferred,

moving a first metal bar (**1**) rearwardly toward the spacer pin (**29**) by a first feed device (**9**) located in front of the spacer pin (**29**) and, simultaneously, moving a second metal bar (**1**) forwardly toward the spacer pin (**29**) by a second feed de-

vice (10) located rearwardly of the spacer pin (29) in a manner such that said first and said second metal bars (1 and 1) abut against the spacer pin (29) with a tail end and a nose end thereof respectively,

moving the spacer pin (29) together with an upper welding mold (24) in a direction transversely of the metal bars to thereby leave a welding gap (2) formed between said tail and said nose ends of the metal bars (1 and 1),

holding the tail and the nose ends of the metal bars (1 and 1) between said upper welding mold (24) and a lower welding mold (17) maintaining the gap,

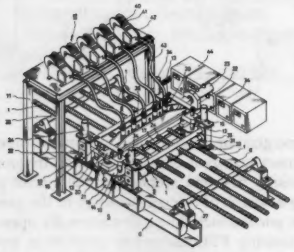
welding the tail and the nose ends of the first and the second metal bars (1 and 1) producing a continuous bar,

releasing the continuous bar from the molds, and moving the continuous bar forwardly along the path by the action of the first and second feed devices.

2. A welding apparatus for welding metal bars (1 and 1), comprising:

rear feed means (10) essentially composed of rollers (32 and 36) for forwardly transferring a plurality of parallel disposed metal bars (1, 1),

front feed means (9) disposed in a forward position of said rear feed means (10) and essentially composed of reversibly rotatable rollers (31 and 35) for forwardly and rearwardly moving a plurality of metal bars (1, 1) in a parallel disposed arrangement thereof,



a mold device (7) disposed between said front feed means (9) and said rear feed means (10) essentially composed of an upper welding mold (24) and a lower welding mold (17), said upper welding mold (24) and said lower welding mold (17) respectively being provided with upper grooves (18) and lower grooves (25), for holding the metal bars (1, 1) between the same,

welding gap setting means (8) mounted on said upper welding mold (24) in a central portion of said grooves (25) thereof and structured such that when said upper welding mold (24) and said lower welding mold (17) are transversely moved with respect to each other, a spacer pin (29) actuated by a spring (30) is projected downwardly from the upper molding mold (24),

a plurality of welding torchs (39) mounted on the upper welding mold (24) at points thereof corresponding to the locations of the lower grooves (25),

a first hydraulic cylinder (16) for driving the upper and the lower welding molds (24 and 17) to abut against each other or to separate from each other, and

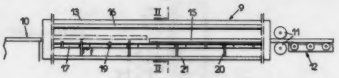
a second hydraulic cylinder (23) for shifting the upper welding mold (24) relative to the lower welding mold (17) transversely with respect to the metal bars.

4,321,449

APPARATUS FOR INDUCTION HEATING OF METAL PRODUCTS, PARTICULARLY SLABS AND BLOOMS

René Courdille, 9, rue Guy de la Brosse, 75005 Paris, France

Filed Dec. 14, 1979, Ser. No. 103,852
Claims priority, application France, Dec. 22, 1978, 78 36230
Int. Cl.[3] H05B 5/02
U.S. Cl. 219—10.71 10 Claims



1. In apparatus for the induction heating of flat metal products, such as flat slabs or blooms, comprising a tunnel, electrical means for induction heating of said products comprising at least two flat inductor means in said tunnel, one of said inductor means being located below the other to provide a path for travel of said products between said inductor means, and means for conveying said products through said path of travel in a flat horizontal position, the improvement wherein:

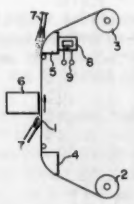
said means for conveying said products comprises supporting and advancing means projecting upward through said one inductor means, for contacting the underside of each of said products at spaced locations along said tunnel to support said products in a flat horizontal position and to advance them along said tunnel, and driving means located below said one inductor means for mounting and driving said supporting and advancing means to advance said products along said path.

4,321,450

METHOD OF AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING WITH A VIBRATING WIRE ELECTRODE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Division of Ser. No. 796,369, May 12, 1977, Pat. No. 4,205,213.
This application Jul. 25, 1979, Ser. No. 60,346
Claims priority, application Japan, May 14, 1976, 51-55743; May 20, 1976, 51-58271; Jul. 21, 1976, 51-87614; Jul. 23, 1976, 51-88376; Aug. 19, 1976, 51-99306; Feb. 18, 1977, 52-16175
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.[3] B23P 1/12
U.S. Cl. 219—69 M 15 Claims



1. A method of electrically machining a conductive workpiece, comprising the steps of:

juxtaposing the workpiece with a traveling-wire electrode supported between a pair of guide members across said workpiece;

relatively displacing said traveling wire electrode and said workpiece transversely to the axis of said traveling-wire electrode and defining a machining gap therebetween;

supplying a machining liquid to said gap;

applying a series of electrical pulses across said workpiece

and said electrode to generate machining discharges in the gap to remove material from the workpiece, and

imparting a vibration at a frequency between 1 and 50 kHz and an amplitude between 1 and 50 microns intermediate said guide members to said traveling-wire electrode in a direction transverse to the axis thereof so that said traveling-wire electrode has an undulating oscillatory motion along said axis with more than two nodes and antinodes or loops with a maximum amplitude smaller than the size of said machining gap in said direction.

4,321,451

SERVO SYSTEM AND METHOD FOR CONTROLLING THE GAP SPACING BETWEEN A TOOL AND WORKPIECE ELECTRODES IN AN EDM MACHINE

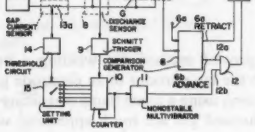
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 24, 1980, Ser. No. 161,389

Claims priority, application Japan, Jun. 21, 1979, 54-78379; Jul. 13, 1979, 54-89439

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 G **18 Claims**



1. A servo control method of controlling the gap spacing between a tool electrode and a workpiece electrode, at least one of which is movable by motor means energizable by a driver circuit, in an EDM machine including a power supply for passing machining pulses across the gap to effect a succession of machining electrical discharges between the tool and workpiece electrodes and thereby to electroerosively remove material from the workpiece electrode, the method comprising the steps of:

bringing said electrodes to a machining position to permit a succession of said machining discharges to be developed therebetween with said pulses from said power supply across said machining gap;

deriving from said machining gap, a first signal representing an enlargement of said gap spacing resulting from material removal from said workpiece electrode with said developed machining discharges while said movable electrode is held against advancement from said machining position in the forward direction;

counting said developed machining discharges between said tool and workpiece electrodes while held in said machining position and, when the counted number of machining discharges reaches a preset level, providing a second signal; and

enabling the development of said first signal with said second signal and applying the developed first signal to said drive circuit, thereby operating said motor means, to permit said movable electrode to be advanced in said forward direction from said machining position to a next machining position.

4,321,452

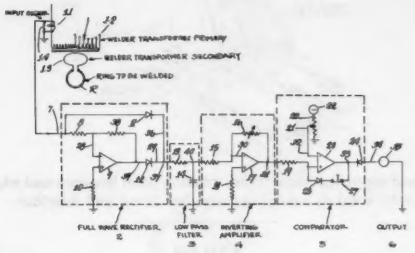
FLASH WELDERS

James F. Deffenbaugh, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 22, 1980, Ser. No. 199,557

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—100 **15 Claims**



1. The method of welding split rings in a flash welder, said rings being formed in high production manner generally with a normal gap between adjoining ends at said split rings but because of variations in material and the like, some rings being formed with larger-than-normal gaps, said flash welder having a pair of work clamps for firmly holding respective end portions of a ring with ring ends extending from said clamps in a direction toward each other with said gap between said clamps, said clamps being respectively carried by movable and stationary platens so that at the beginning of a welding cycle said ring ends may be moved toward each other and welding current applied therebetween when said movable platen has been moved toward said stationary platen an amount equal-to or slightly-greater-than said normal gap to effect a satisfactory weld between said ring ends having a normal gap, the method of accounting for rings having a larger-than-normal gap, comprising,

establishing a first signal when said movable platen has moved a distance equal-to or slightly-greater-than is required for beginning of flashing between ring ends with a normal gap,

establishing a second signal at a position of the movable platen when flashing actually begins between the ring ends, and

effecting operation of control means when said second signal is established a predetermined time after said first signal.

4,321,453

ELECTRON-BEAM WELDING

Kiyohide Terai, Arlington, and George Mackertich, Plymouth, both of Mass., assignors to International Vacuum, Inc., Pembroke, Mass.

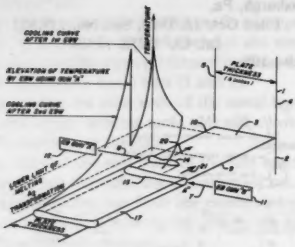
Filed May 5, 1980, Ser. No. 146,205

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 ED **5 Claims**

1. A method of electron beam welding two metal plates of which at least one is formed of a magnetic material along abutting edges forming an interface between said plates comprising directing an electron beam from one edge of said interface inwardly thereof until the temperature of the metal at the interface adjacent said one edge is close to the metal transformation point whereby any magnetic field inherent in said metal plate is eliminated, and thereafter while said metal remains

substantially at said temperature, directing an electron beam from the other edge of said interface until the temperature is



raised above the metal transformation point between said edges thereby welding said plates together along said interface.

4,321,454

METHOD OF AND WELDING TORCH FOR ARC WELDING

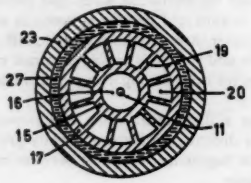
Gerardus A. M. Willems, and Gerrit W. Tichelaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 896,235, Apr. 13, 1978, Pat. No. 4,234,778. This application Sep. 2, 1980, Ser. No. 183,484

Claims priority, application Netherlands, Apr. 26, 1977, 7704527

Int. Cl.[3] B23K 9/16

U.S. Cl. 219—121 PJ 4 Claims



1. A plasma-MIG welding torch, which comprises a cylindrical housing; a single nozzle non-consumable electrode positioned adjacent one end of said cylindrical housing, said single nozzle having a central orifice, an annular opening surrounding said central orifice, and a plurality of ribs extending radially from said central orifice to said cylindrical housing and providing electrical connection therebetween; means for flowing a thermally ionizable gas stream from a common gas source through said single nozzle non-consumable electrode toward a workpiece to thereby split said gas stream into a central gas column surrounded by a parallelly flowing annular gas sheath both having the same composition as they flow past the single nozzle outlet; means for feeding a consumable electrode through said central gas column toward the workpiece; a first circuit means consisting basically of said consumable electrode, a first power supply, and said workpiece for establishing a MIG-arc between the consumable electrode and the workpiece; a second circuit means consisting basically of a second power supply, said single nozzle non-consumable electrode, and said workpiece for establishing a plasma arc between the single nozzle non-consumable electrode and the workpiece to ionize said central gas column and sustain a plasma flow enveloping said MIG-arc without ionizing the surrounding annular gas sheath, said annular gas sheath remaining relatively colder than the resulting central plasma gas column; and a cylindrical gas conductor surrounding said single nozzle non-consumable electrode and forming an extension of said cylindrical housing, said cylindrical gas conductor being electrically insulated from said cylindrical housing and terminating in an outlet aperture downstream of said single nozzle non-consumable electrode, the cross-sectional area of the gas conductor outlet aperture being smaller than the combined cross-sectional areas of the single nozzle central orifice and the surrounding single nozzle annular opening, whereby the relatively colder gas sheath is constricted by said gas conductor outlet aperture and is driven into the central plasma gas column and expanded by the latter by heating to thereby also constrict the central plasma gas column and increase its flow rate.

4,321,455

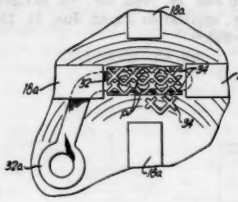
METHOD FOR WELDING BATTERY TERMINAL CONNECTORS TO ELECTRODE GRID TABS

Michael S. Hill, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Oct. 25, 1978, Ser. No. 954,481

Int. Cl.[3] B23K 9/08

U.S. Cl. 219—123 7 Claims



1. An improved method for welding a battery terminal connector to the tab portions of an electrode grid in a wound battery cell core, using a torch flame emanating from the torch head of an ionized gas arc torch apparatus, wherein the improvement comprises:

controllably varying, during a welding operation, the angular orientation of the torch flame relative to a plane passing through the tip of the torch head, such that the tip of the torch flame can be moved substantially in two dimensions to provide a generally elliptical weld pattern and permit welding over an area portion of the connector and tab portions to be welded while the battery cell core and the torch apparatus remain essentially stationary relative to each other.

4,321,456

ELECTRICAL HOT AIR APPLIANCE

Helmut Ohnmacht, and Klaus Meywald, both of Kandel, Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,377

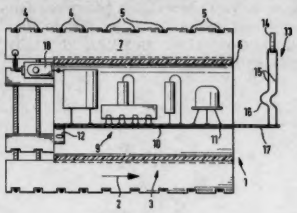
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849316

Int. Cl.[3] H05B 1/02

U.S. Cl. 219—364 9 Claims

1. A hot air appliance comprising an electrical heating conductor, a blower for forcing air over the heating conductor, an electronic circuit including a temperature sensor for regulating or controlling operation of the appliance, a substantially planar plate with the electronic circuit arranged thereon, and a heat conductor support means including a heat-shielding tubular section, with the electrical heating conductor supported on the outside of the tubular section, said plate located in the interior of said tubular section such that the electronic circuit is

shielded by said tubular section from heat generated by the heating conductor, with the temperature sensor projecting



exteriorly of the tubular section, into a heated air current flowing along the outside of the tubular section.

4,321,457

METHOD AND DEVICE FOR THE BURNING OF AN ARTIFICIAL CARBON BODY, ESPECIALLY OF AN ANODE FOR THE ALUMINUM FUSION ELECTROLYSIS

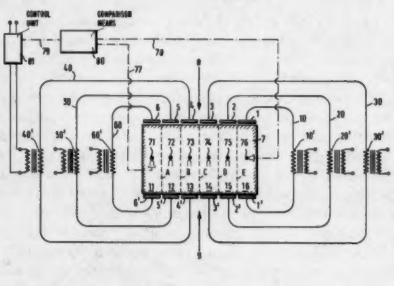
Wilhelm Edel; Reinhold Heindl, both of Cologne; Friedel Isenhardt, Rösrath-Forsbach, and Ernst Schultze-Rhonhof, Bonn, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Ag, Fed. Rep. of Germany

Filed Feb. 21, 1980, Ser. No. 123,341

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906678

Int. Cl.³ H05B *1/02, 3/74*

U.S. Cl. 219—497 **2 Claims**



1. In a method for burning an artificial carbon body, especially usable as an anode for aluminum fusion electrolysis, where the body, a preformed green casting, is heated by means of electric resistance heating, an improvement comprising the steps of:

dividing the casting into at least two regions, and heating each region essentially independently by passing a separately adjustable electrical current through each region of the casting;

sensing the temperature of each region of the casting;

comparing the sensed temperature of each region of the casting to a preselected value;

adjusting the power supplied to each region by the associated electric resistance heating circuit so as to minimize any difference between the sensed temperature of each region and the preselected value; and

selecting the direction of current flow through each region of the casting to correspond to the direction of the forces used in compressing the green artificial carbon body while forming the casting.

4,321,458

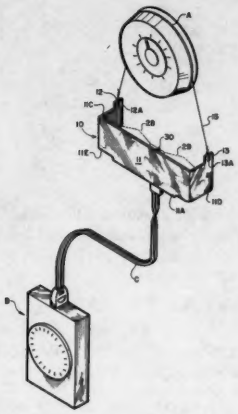
SETBACK DEVICE

William R. Comber, Rte. 3, Box 100, New London, N.C. 28127

Filed Feb. 18, 1981, Ser. No. 235,756

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—511 **3 Claims**



1. In an electric temperature setback device for being placed in proximate relation to a conventional thermostat and for being operatively controlled by a timing device for providing local warmth to the thermostat at pre-determined times and for pre-determined intervals, the improvement which comprises means for arraying two incandescent light sources in series across an electrical circuit for reducing the voltage and decreasing the filament temperature of each light source, thereby increasing the amount of heat energy produced proportional to the amount of light energy produced and thereby creating a more efficient heat source, said means for arraying said two light sources in series comprising:

(a) an enclosure for partially enclosing said two light sources and including openings spaced therein for directing heat upwardly in a pre-determined manner towards the thermostat, said enclosure including a non-conductive base;

(b) two electrically conductive spades mounted in appropriate spaced-apart relation through said base and projecting beyond the outer surface of said enclosure for being received in a conventional alternating current female electrical plug, said two spades each having an integral female connector positioned on the inner side of said base within said enclosure and having a central annular opening therein for receiving the light source; and,

(c) means for completing electrical interconnection in series between said two light sources.

4,321,459

ELECTRICAL HEATING MOLDED-ELEMENT COMPRISING INORGANIC FIBERS

Yoshihisa Miyahara, Yokohama; Kimimasa Kobayashi, Kumagaya; Yawara Kobayashi, Hanyu, and Tsuneo Harada, Kumagaya, all of Japan, assignors to Nichias Corporation and Riken Corporation, both of Tokyo, Japan

Filed Mar. 7, 1980, Ser. No. 128,121

Claims priority, application Japan, Mar. 16, 1979, 54-30652; Mar. 27, 1979, 54-35124

Int. Cl.³ H05B *3/48, 3/66*

U.S. Cl. 219—544 **6 Claims**

1. An electrical heating element comprising:

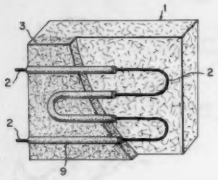
a heating wire;

a layer of inorganic fiber molded from a slurry into a fibrous molded layer having first and second opposed sides;

said heating wire being embedded into said fibrous molded layer closer to said first side than to said second side;

a treated zone in said layer extending at least from said first side to said heating wire;

said treated zone including a sheathing of an inorganic material molded on said heating wire; and



said sheathing having a density and heat conductivity substantially higher than the remainder of said layer whereby heat dissipation through said first side and durability of said heating element are improved.

4,321,460

DIGITAL CONTROL APPARATUS

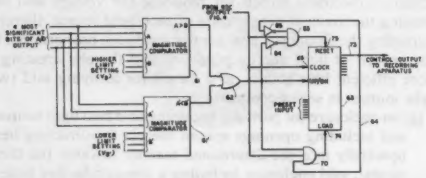
Said Mohammadioun, Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Division of Ser. No. 960,602, Nov. 14, 1978, abandoned, which is a division of Ser. No. 756,386, Jan. 3, 1977, Pat. No. 4,125,865. This application Mar. 14, 1980, Ser. No. 130,477

The portion of the term of this patent subsequent to Nov. 14, 1995, has been disclaimed.

Int. Cl.³ G06M *3/04*

U.S. Cl. 235—92 CT **5 Claims**



1. A digital detection and control apparatus responsive to an input carrying a digital number and a clock signal indicating the presence of a valid digital number on said input comprising:

a digital magnitude comparator for providing a direction output in response to said digital number being within a predetermined range of magnitudes;

a scale of N up/down counter, N being an integer, responsive to said direction signal and said clock signal to provide a counting function to increment upon each occurrence of said clock signal in the presence of said direction output and alternately decrement upon each occurrence of said clock signal in the absence of said direction output;

means for providing a control output when said scale of N counter contains a count greater than or equal to M, M being an integer less than N;

first presetting means for overriding said counting function and for presetting said counter to an integer K, K being less than M, upon each occurrence of said clock signal during the simultaneous absence of said direction output and said control output; and

a second presetting means for presetting said counter to an integer L, L being greater than M and less than or equal to N, upon each occurrence of said clock signal during the simultaneous presence of said control output and said direction output.

4,321,461

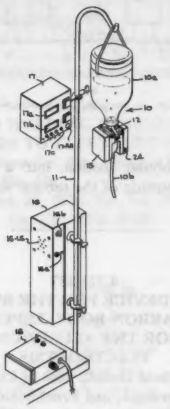
FLOW RATE MONITOR AND TOTALIZER WITH COUNT DISPLAY

David E. Walter, Jr., and Max G. Kolmes, both of Milan, Tenn., assignors to K/W/D Associates, Memphis, Tenn.

Filed Apr. 18, 1980, Ser. No. 141,644

Int. Cl.³ G06M *3/02*; G08B *21/00*; A16M *5/16*

U.S. Cl. 235—92 FL **18 Claims**



1. Flow rate monitor for sensing and counting discrete liquid drops passing along a drop path through a drop sensing zone in an intravenous set drop chamber or the like and providing a count display, comprising detector means including a pulsed infrared radiation emitter and receiver pair forming an IR pulsed radiant energy monitoring beam located to be intercepted by said drop path at said sensing zone for interruption of the beam by said drops, the detector means including signal means responsive to drop interruption of said beam to produce a drop signal for each such drop interruption; said emitter and receiver comprising an emitter diode and a spectrally matched phototransistor and stabilization feedback circuit means coupled to said phototransistor including a transistor connected to said phototransistor providing a low impedance to the latter and connected to Operational Amplifiers interconnected to provide stabilization feedback voltage to said phototransistor to compensate for variations in gain of the emitter and receiver and maintain predetermined gain conditions on the phototransistor; electronic circuit means including counter means responsive to said drop signals for counting said drop signals and maintaining a totalized count of the number of drops since a selected start time to provide total drop count signals, first numeric display means responsive to said total drop count signals for presenting a visible numerical display continuously indicating the current drop count according to a predetermined numeric function, no-drop alarm means responsive to absence of said drop signals under predetermined criteria for producing a first sensible alarm condition signaling a no-drop condition, and checkpoint alarm means responsive to the total drop count reaching a prescribed total volume amount for producing a second identifiable alarm condition.

4,321,462

LIGHT MEASURING DEVICE

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Nov. 20, 1979, Ser. No. 96,002

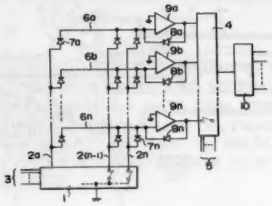
Claims priority, application Japan, Nov. 22, 1978, 53-144501

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—211 J **1 Claim**

1. A light measuring device comprising a plurality of photoreceptors which are arranged regularly along X-lines and

Y-lines in a matrix, an X-direction multiplexer connected with the X-lines, a Y-direction multiplexer connected with the Y-lines, log-conversion amplifiers connected with the Y-lines between the Y-direction multiplexer and the outputs of the Y-lines to log-compress the output of the photo receptors before the output is inputted into the Y-direction multiplexer,



means for selectively taking out the output of a desired photoreceptor as a log-compressed output voltage by designating the code of the X-direction multiplexer and the Y-direction multiplexer, and said photoreceptors, said X- and Y-direction multiplexers, and said log-conversion amplifiers being integrated on a single chip as an IC element.

4,321,463

LOW FREQUENCY LASER FIBEROPTIC DETECTOR APPARATUS FOR MUSICAL INSTRUMENTS AND INTRUSION DETECTION

Samuel J. Stecher, 390 Ogden Ave., Jersey City, N.J. 07307

Filed Dec. 17, 1979, Ser. No. 104,560

Int. Cl.[3] G02B *5/14*

U.S. Cl. 250—227 **9 Claims**

1. A musical instrument including a low frequency laser fiberoptic detector apparatus comprising:

a plurality of elongated optical fiber means each having a light receiving end and a light transmitting end;

a plurality of tension means associated respectively with each of said elongated optical fiber means for putting at least a portion of each of said elongated optical fiber means into tension;

a musical instrument body means for carrying said plurality of optical fiber means and said plurality of tension means;

coherent light source means for introducing coherent light into said plurality of elongated optical fiber means; and,

optical detector means for detecting the multi-path interference pattern of said light as received by said detector means at the transmitting end of said plurality of elongated optical fiber means and converting said pattern into an electrical signal,

wherein low frequency vibrations in the musical frequency range imparted to said elongated optical fiber means are detected by said detector means and converted into electrical signals having a frequency directly proportional to the frequency of vibration of said elongated optical fiber means.

4,321,464

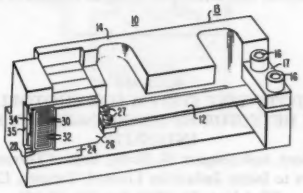
DEVICE FOR MEASURING VIBRATION PHASE AND AMPLITUDE

Robert C. Miller, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 913,774, Jun. 8, 1978, Pat. No. 4,218,614. This application Jan. 24, 1980, Ser. No. 114,921

Int. Cl.[3] G01D *5/34*

U.S. Cl. 250—231 R **24 Claims**



1. A device for measuring vibration of a vibratory member, said device comprising: a reed attached to said vibratory member for movement therewith; a light source; a light receiver, said light source and light receiver being positioned for transmission of light from the source to the receiver; said reed including a mask portion extending across the light path between the source and the receiver, said mask portion having a plurality of light-directing elements extending transversely of the light path; a stationary mask extending across the light path, and having at least one light transmitting element; a predetermined mass attached to said reed; and light receiving means including means for counting the number of pulses of light, transmitted to the light receiving means, for each vibration of said vibratory member.

4,321,465

INFRARED ASSAY OF KEROGEN IN OIL SHALE

Carole S. Stover, Irvine, and Leslie E. Compton, Claremont, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 40,979, May 21, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,773

Int. Cl.[3] G01V *5/00;* G01J *1/00;* G01D *18/00*

U.S. Cl. 250—255 **16 Claims**

6. A method for determining the kerogen content of oil shale comprising:

comminuting the oil shale to form a representative sample of the oil shale;

mixing the comminuted oil shale sample with an internal standard having a known infrared absorbance in a portion of the infrared region of the electromagnetic spectrum in which oil shale does not absorb;

transmitting infrared light from the region of the electromagnetic spectrum having a wave number of from about 4000 to about 625 cm^{-1} through the mixture of comminuted oil shale sample and internal standard;

measuring the absorbance of such infrared light by the mixture of comminuted oil shale and internal standard over such a region of the electromagnetic spectrum; and

correlating the ratio of the absorbance of infrared light at a characteristic wave number for kerogen and the absorbance of infrared light at a characteristic wave number for the internal standard to the kerogen content of the sample.

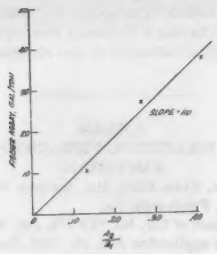


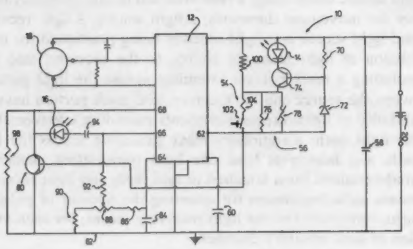
Fig. 4

4,321,466

SENSITIVITY TEST SYSTEM FOR PHOTOELECTRIC SMOKE DETECTOR BY CHANGING LIGHT SOURCE INTENSITY

John Mallory, and Zbignew W. Turlej, both of Toronto, Canada, assignors to Isotec Industries Limited, Toronto, Canada

Filed Nov. 26, 1979, Ser. No. 97,161
Int. Cl.³ G01N *15/06*
U.S. Cl. 250—574 **15 Claims**



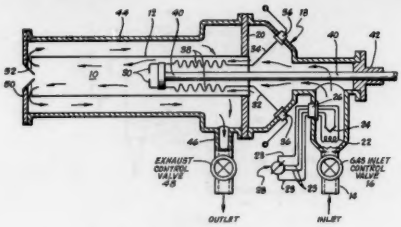
1. In a photoelectric smoke detector for setting off an alarm on detecting a predetermined concentration of smoke particles in the air, said detector having an open chamber into which smoke particles may enter, a source of radiant energy being directed along a path through said chamber and which is capable of being scattered by smoke particles in said chamber and being scattered and reflected by wall portions of said chamber, a photoelectric sensor offset from said path of radiant energy for sensing scattered radiant energy, a controller connected to said sensor and adapted to actuate an alarm when said sensor senses an amount of radiant energy scattered by said predetermined concentration of smoke particles in said chamber, said chamber wall portions being adapted to scatter and reflect a relatively small portion of incident radiant energy from said source which is insufficient to actuate said alarm, test means for testing said detector, said test means when actuated, being adapted to increase the level of radiant energy emitted by said source to a level which produces an amount of radiant energy scattered and reflected by said wall portions of said chamber essentially free of smoke particles onto said sensor to simulate that which would be scattered by a concentration of smoke particles essentially the same as said predetermined concentration and thereby actuate a device to confirm detector operability and desired sensitivity.

4,321,467

FLOW DISCHARGE ION SOURCE

Sidney E. Buttrill, Jr., Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jun. 4, 1980, Ser. No. 156,511
Int. Cl.³ B01D *59/44*
U.S. Cl. 250—288 **9 Claims**



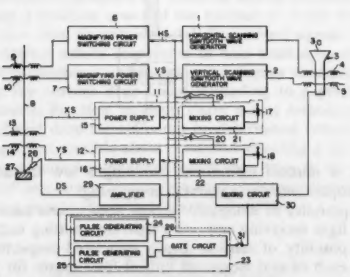
1. In a flow discharge ion source for selectively injecting positive and negative ions into the lens system of a mass spectrometer, a reaction and ionization tube defining a region through which reagent and sample gas flows and in which ionization thereof takes place, said reaction and ionization tube having an entry end for receiving the said reagent and sample gas and an exit end for extraction of ions therefrom, an exit withdrawal tubular member surrounding and substantially concentric with the said reaction and ionization tube for removal of excess gas molecules flowing through the said ionization tube, and ionization means within the said ionization tube for selectively generating positive and negative ions, wherein means is provided for independently and selectively controlling reagent gas pressure, reagent gas temperature, reagent and sample ion residence time, and positive and negative ion mode of operation.

4,321,468

METHOD AND APPARATUS FOR CORRECTING ASTIGMATISM IN SCANNING ELECTRON MICROSCOPES AND SIMILAR EQUIPMENT

Takashi Kimura, Zama, Japan, assignor to Kabushiki Kaisha Akashi Seisakusho, Japan

Filed Jul. 9, 1980, Ser. No. 167,134
Claims priority, application Japan, Jul. 12, 1979, 54-88409
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—307 **9 Claims**



1. A method of correcting astigmatism in scanning electron microscope comprises steps of, in a scanning electron microscope having a Braun tube on which an image of a specimen is reproduced, moving an astigmatism correcting image, appearing on part of a screen of said Braun tube until matching a predetermined point on said screen by supplying one of said sawtooth waves which synchronize with horizontal and verti-

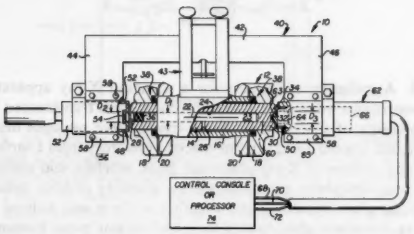
cal scanning sawtooth waves for scanning charged corpuscular rays horizontally and vertically together with an X direction astigmatism correcting current to an X direction astigmatism correcting member, supplying the other of said sawtooth waves together with a Y direction astigmatism correcting current to a Y direction astigmatism correcting member, then controlling said X and Y direction astigmatism correcting currents, and stopping the supply of said sawtooth waves to said X and Y direction astigmatism correcting members.

4,321,469

NUCLEONIC GAUGE FOR DETERMINING LUBRICANT LEVEL IN A JOINT AND METHOD

William P. Evans, Peoria, and Jan C. Kline, Brimfield, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1979, Ser. No. 140,501
Int. Cl.³ G01N *23/00*; G01F *23/00*
U.S. Cl. 250—358 R **15 Claims**



1. A nucleonic gauge **(10)** for quantitatively determining the amount of lubricant in an assembled joint **(12)** having an axis **(22)** and an elongate lubricant reservoir **(23)** on the axis **(22)**, the gauge **(10)** comprising:

radiation means **(48)** for homogeneously emitting penetrating gamma radiation at one end of the joint **(12)**, cooperating with the lubricant reservoir **(23)**, and providing a collimated beam pattern **(60)** at the other end of the joint **(12)**, the radiation means **(48)** including a cylindrical radiation disc **(54)**;

detector means **(50)** for reacting to the radiation in relation to the amount of lubricating fluid in the joint **(12)**, the detector means **(50)** including a detector element **(64)** located at the other end of the joint **(12)** in the path of the collimated beam pattern **(60)**; and

supporting means **(40,43)** for serially aligning the radiation means **(48)**, the joint **(12)** and lubricant reservoir **(23)**, and the detector means **(50)** substantially on the axis **(22)**.

4,321,470

ELECTRON FLOOD EXPOSURE APPARATUS

Michael Kaplan, Franklin Township, Somerset County; Eugene S. Poliniak, Willingboro, and Dietrich Meyerhofer, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,069
Int. Cl.³ A61K *27/02*; G01K *1/08*; H01J *29/74*
U.S. Cl. 250—398 **7 Claims**

1. A flood exposure apparatus comprising:

an electron gun to provide an electron beam;

a dispersing means for converting the electron beam into an electron flood;

a post dispersion electron flood acceleration grid;

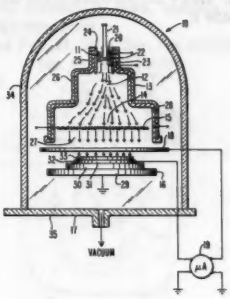
a target holding means and

a vacuum chamber;

said dispersing means being comprised of a funnel shaped member having diverging walls extending out from a neck aperture at the narrow end of said funnel shaped member to the opposite terminal end of said funnel shaped member to define an enlarged exit aperture said funnel shaped member further having a conductive layer on the interior surface thereof which is electrically connected so as to be maintained at a first electrical potential sufficient to disperse an electron beam emitted into the interior of the funnel shaped member into an electron flood;

said electron gun being mounted in the neck aperture and positioned so as to project an electron beam into the interior of the funnel shaped member towards the exit aperture thereof;

said post dispersion acceleration grid being positioned across and parallel to the exit aperture and being adapted to be maintained at a second potential higher than said first potential whereby the flood of electrons passing through said grid are collimated and accelerated towards the target holding means;



said target holding means including apparatus for holding a microlithographic resist in the accelerated collimated electron flood emitted from the post dispersion acceleration grid;

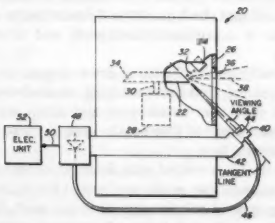
said electron gun, dispersing means, post dispersion acceleration grid and target holding means being positioned within the interior of said vacuum chamber whereby when a beam of electrons is emitted by the electron gun into the interior of dispersing means, the beam is converted into an electron flood, the electron flood is then collimated and accelerated by the post dispersion electron beam acceleration grid to provide a collimated accelerated flood of electrons which is projected to a resist medium held by the target holding means whereby the resist is exposed with a substantially uniform flood of electrons.

4,321,471

X-RAY TARGET MONITOR

William P. Holland, West Redding, and Anthony Pellegrino, New Fairfield, both of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Feb. 4, 1980, Ser. No. 118,144
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—406 **16 Claims**



15. An X-radiation monitor comprising:

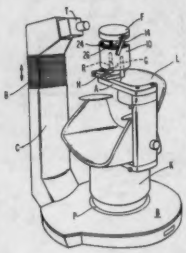
a rotatable target having an X-radiation emitting surface;
electron source means for directing electrons onto said surface and producing X-radiation from said surface;
detector means responsive to said X-radiation from said surface for producing an electrical signal related to the intensity of said X-radiation; and
means coupled to said detector means for measuring a frequency component of said electrical signal.

4,321,472

PANORAMIC DENTAL X-RAY MACHINE WITH CAMERA DETACHED THEREFROM

Robert H. Cushman, Princeton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 21, 1980, Ser. No. 142,481
Int. Cl.³ G01N *23/00*; G21K *5/06*; G11B *1/00*
U.S. Cl. 250—439 P 1 Claim



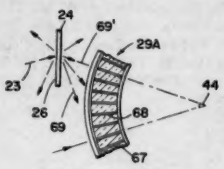
1. In a panoramic dental x-ray machine for providing continuous and discontinuous type radiographic images of dental arch-temporomandibular joint area of a patient seated in a chair mounted for movement in accordance with type image desired, the improvement to said machine comprising
a column extending upwardly from said machine for carrying a tubehead containing an x-ray source for generating x-rays, means for powering said x-ray source, said column rotating about said seated patient,
a camera assembly having film for activation by said x-rays, said camera assembly being detached from said tubehead and mounted on said chair in alignment with said tubehead for receiving said x-rays after passing through said dental arch, said camera assembly being adjustably mounted to said patient chair and with respect to said patient,
means for maintaining said camera assembly in said receiving alignment with said tubehead while said tubehead rotates about said patient,
means for non-linearly driving said film in said camera assembly in accordance with type radiographic image desired, said camera assembly including
an output shaft driven by said means for non-linearly driving said film,
drum means rotating in accordance with said output shaft,
said film mounted to said drum means whereby non-linear rotation of said shaft causes said drum means and said film to rotate in accordance therewith, said drum means including
a substantially semi-cylindrical drum cupped about the face of said patient, said drum rotating on a substantially vertical axis such that rotation of said drum about said axis causes said drum to continually pass in close proximity to said patient's face,
said chair being provided with head positioning means,
an x-ray transmitting mask configured for stationary disposition in spaced relationship between said drum and patient's face, said mask being adjustably supported on a rod interconnecting said means for non-linearly driving said film in said camera assembly and said mask, said mask being light-opaque, and
a bite block rigidly extending from said rod.

4,321,473

FOCUSING RADIATION COLLIMATOR

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Division of Ser. No. 803,077, Jun. 3, 1977, Pat. No. 4,196,351.
This application Dec. 5, 1979, Ser. No. 100,421
Int. Cl.³ G02B *5/00*
U.S. Cl. 250—505 1 Claim



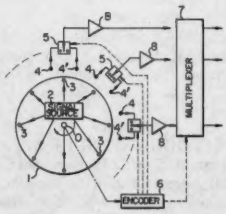
1. A radiation collimator for a scanning X-ray apparatus comprising a volume of X-ray-absorbent glass transpierced by a plurality of spaced apart X-ray-transmissive passages being directed toward a single point spaced outwardly from a surface of said volume of X-ray-absorbent glass, wherein said volume of x-ray-absorbent glass comprises a plurality of fiber optical tubular glass elements fused together to form said volume of x-ray-absorbent glass having long and narrow x-ray transmissive passages therethrough.

4,321,474

OPTICAL SIGNAL TRANSMISSION APPARATUS

Eiichi Tanaka, Mitaka; Takehiro Tomitani, Chiba; Katsumi Takami, Tokyo, and Kenji Ishimatsu, Abiko, all of Japan, assignors to National Institute of Radiological Sciences and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 105,925
Claims priority, application Japan, Dec. 28, 1978, 53/161165
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 3 Claims



1. An optical signal transmission apparatus comprising a plurality of light emitting elements, a pluraity of light receiving elements disposed in opposition to each of said light emitting elements with a predetermined space therebetween, a signal source associated with said light emitting elements for exciting them into illumination, and selector means associated with said light receiving elements for sequentially selecting them with a predetermined period, whereby lights emitted from said light emitting elements are sequentially received by said light receiving elements with said predetermined period, wherein said light emitting elements are provided in a rotatable body with a predetermined distance therebetween, said light receiving elements being selected in synchronism with the rotation of said rotatable body.

4,321,475

HYDROELECTRIC POWER GENERATING ARRANGEMENT

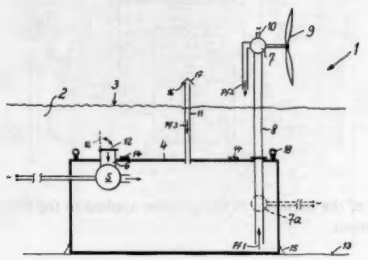
Rainer Grüb, Richard Wagner Str. 55, D-7800 Freiburg, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,154

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843675; Jul. 7, 1979, 2927498

Int. Cl.³ F15B 11/06; F03D 9/02

U.S. Cl. 290—52 27 Claims



1. An electric power generating arrangement, comprising means bounding an enclosed receiving space which is separated from and at least partially situated below the upper level of a body of water, said means including a container which is at least partially immersed in the body of water; means for communicationg said receiving space with the body of water; water-displacement means located in said communicating means and operative to generate electric power when water flows through said communicating means into said receiving space due to a hydrostatic pressure differential between the body of water and said receiving space, and to pump water out of said receiving space through said communicating means; and wind-driven means for driving said water-displacement means during the pumping operation thereof.

4,321,476

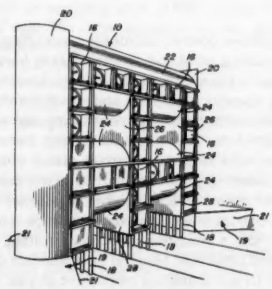
BI-DIRECTIONAL WIND POWER GENERATOR

Jesse H. Buels, 2810 Gold Ave., El Paso, Tex. 79930

Filed Jun. 24, 1980, Ser. No. 162,605

Int. Cl.³ F03D 9/02

U.S. Cl. 290—55 9 Claims



1. A bi-directional wind power generating structure comprising:

a vertically extending framework having a plurality of individual passageways formed therein;

a generating structure mounted in each of said passageways, said generating structure comprising a propeller shaft extending axially within the associated passageway and propeller blades mounted on said propeller shaft, said propeller blades being mounted to the associated propeller shaft through a spring loaded pitch control means for automatically adjusting the pitch of said propellers in response to air speeds; and

deflector means associated with said passageways for deflecting oncoming air in a direction to increase the wind pressure gradient from the windward to leeward side of the passageways, said generating structure being positioned in a central zone of the associated passageway, and further including entrance and exit zones positioned on opposite sides of said central zone, said entrance and exit zones of adjacent passageways being insulated from each other to trap solar radiation in said central zone.

4,321,477

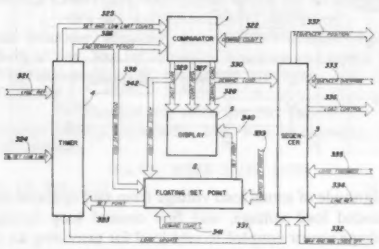
ENERGY MANAGEMENT APPARATUS AND METHOD

Peter G. Bartlett, Davenport, Iowa, assignor to Automation System, Inc., Elridge, Iowa

Filed Feb. 11, 1976, Ser. No. 657,033

Int. Cl.³ H02J 3/00

U.S. Cl. 307—35 9 Claims



1. Energy management apparatus comprising:

comparator means for comparing a demand count, indicative of power consumption by a plurality of loads, with a set point count and for producing a load demand indication dependent upon said comparison including,

a multiple-digit scanned output demand counter receiving demand count pulses,

a multiple-digit scanned output set point counter receiving set point pulses,

means for synchronizing scanning of the digits of the counters by stopping digit scanning of a counter which falls behind in the digit scan cycle until the next scan cycle of the driving counter returns the counters to equally significant digits, and

load control means responsive to said load demand indication for controlling the application of power to loads of said plurality of loads.

4,321,478

AUXILIARY POWER SUPPLY WITH KINETIC ENERGY STORAGE

Allan B. Plunkett, and Fred G. Turnbull, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,684

Int. Cl.³ H02K 7/02

U.S. Cl. 307—47 10 Claims

1. A power supply for use on transit cars or the like for supplying an auxiliary load thereon with alternating current from a DC source, comprising:

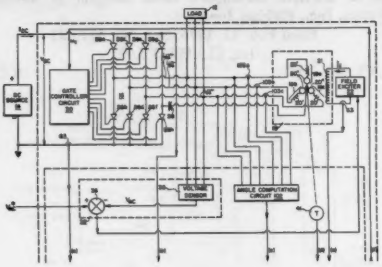
(a) an inverter adapted to be coupled between said DC source and said auxiliary load for supplying said load with a predetermined magnitude of current;

(b) a synchronous machine coupled to said inverter and to said load, said synchronous machine converting electrical energy into kinetic energy when load current does not exceed said predetermined magnitude of current and said synchronous

machine converting stored kinetic energy into electrical energy to supply the load current drawn by said load in excess of said predetermined magnitude of current and to supply said load with alternating current whenever coupling between said inverter and said DC source is interrupted; and

(c) control means adapted to be supplied with a frequency command signal proportional in magnitude to an operator-commanded load frequency and with a voltage command signal proportional in magnitude to an operator-commanded load voltage, said control means coupled to said inverter and said synchronous machine for controlling the frequency and magnitude of load voltage in accordance with operator-commands, said control means having

a first control loop for regulating the magnitude of voltage supplied to said load in accordance with the difference



magnitude of actual load voltage from said operator-commanded load voltage; said first control loop having a voltage sensor coupled to said load for providing an output signal which varies in accordance with the magnitude of load voltage; and summing amplifier means having a first input adapted to be supplied with said voltage command signal and a second input coupled to said voltage sensor, the output of said summing amplifier means being coupled to said synchronous machine for controlling synchronous machine field current in accordance with the difference magnitude between said voltage sensor output signal and said voltage command signal;

a second control loop for regulating the frequency of voltage supplied to said load in accordance with the difference magnitude of actual load frequency from said operator commanded load frequency.

4,321,479

TOUCH ACTIVATED CONTROLLER AND METHOD

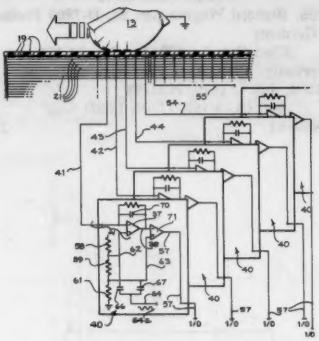
Ferenc Ledniczki, Foster City; Richard J. Patak, San Jose, and Ronald G. Wayne, Milpitas, all of Calif., assignors to Touch Activated Switch Arrays, Inc., Santa Clara, Calif.

Division of Ser. No. 897,686, Apr. 19, 1978, Pat. No. 4,221,975. This application Mar. 17, 1980, Ser. No. 130,817

Int. Cl.³ H01H *35/00*

U.S. Cl. 307—116 **1 Claim**

1. In a touch sensitive circuit comprising an input adapted to be coupled to a sense line for supplying a change in capacitance via said input, an operational amplifier coupled to receive said change via said input, capacitance means coupled across said operational amplifier between the input and output thereof, comparator means coupled to said output of said operational amplifier, means for generating first and second signals at varying voltages normally plottable along substantially parallel traces, means for coupling said first and second signals respectively to supply signals to said operational amplifier and said comparator means to vary said output of said operational amplifier to be compared to said second signal to provide periodic cross-over between said first and second signals indic-



ative of the presence of capacitance applied to the first named said input.

4,321,480

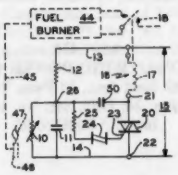
POSITIVE DIFFERENTIAL ALTERNATING CURRENT SWITCHING MEANS

Gregory M. Miles, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 14, 1980, Ser. No. 121,630

Int. Cl.³ H01H *47/24, 47/32*

U.S. Cl. 307—117 **7 Claims**



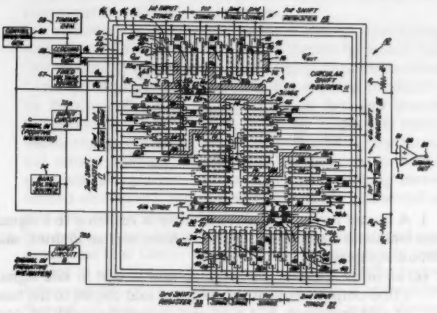
1. A condition control circuit for controlling inductive load means, including: solid state switch means having load terminals adapted to connect the inductive load means to a source of alternating current; said solid state switch means further including gate means capable of controlling said switch means to in turn control the flow of an alternating current in said load means; condition responsive circuit means connected to said source of alternating current and including condition responsive element means which varies in impedance with a change in a sensed condition whereby said condition responsive circuit means provides a condition responsive voltage with a change in said sensed condition; bilateral switch means connecting said gate means to said condition responsive circuit means to apply said condition responsive voltage to control said solid state switch means; and capacitor means with one terminal connected to a load terminal common to said solid state switch means and said load means, and another terminal directly to said condition responsive voltage; said capacitor means coupling a single voltage change from said load means to said gate means to insure full wave conduction of said solid state switch means upon an initial conduction of said bilateral switch means upon said bilateral switch means responding to said condition responsive voltage.

4,321,481

RECURSIVE CHARGE TRANSFER FILTER WITH A TRANSMISSION ZERO AT ZERO FREQUENCY

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 27, 1980, Ser. No. 153,712
Int. Cl.[3] G11C *19/28;* H01L *29/78;* H03H *15/02*
U.S. Cl. 307—221 D 4 Claims



1. In combination,

A circular shift register having N stages where N is an even number greater than two, each stage including a respective first charge storage cell,

first means for transferring charge in said circular shift register from first charge storage cell to first charge storage cell thereof in the direction of order designation of the stages thereof and at one frequency,

means providing a first input sequence of packets of charge, each packet representing a respective sample of a first input signal,

a first shift register including a plurality stages, each stage including a respective first charge storage cell,

a second shift register including L stages where L is an integer, each stage including a respective first charge storage cell,

means for dividing each of said packets of charge of said first input sequence into a first part and a second part, the ratio of said first part to said second part being equal to a first fixed value,

means for applying each of said first parts of said packets of said first input sequence to the input stage of said first shift register and for applying each of said second parts of said packets of said first input sequence to the input stage of said second shift register,

second means for sequentially transferring at said one frequency each of said first parts of said first sequence of packets of charge from first charge storage cell to first charge storage cell of the stages of said first shift register,

third means for sequentially transferring at said one frequency each of said second parts of said first sequence of packets of charge from first charge storage cell to first charge storage cell of the stages of said second shift register,

said first, second and third transferring means being synchronized to provide storage of charge packets in the first charge storage cells of said first and second shift registers and in the first charge storage cells of said circular shift register over a common interval of time, recurrent at said one frequency,

first means for combining the charge packet in the first charge storage cell in the K^{th} stage of said first shift register with the charge packet in the first charge storage cell of the N^{th} stage of said circular shift register during each of said common intervals of time and for dividing the combined packet of charge into two portions, a first portion being stored in the first charge storage cell of said K^{th} stage and a second portion being stored in the first charge storage cell of the N^{th} stage of said circular shift register, the ratio of said first portion of charge to the combined charge packet being equal to a second fixed value,

means for transferring each first portion of a respective combined packet of charge out of said first charge storage cell of said K^{th} stage at said one frequency to obtain a first output sequence of packets,

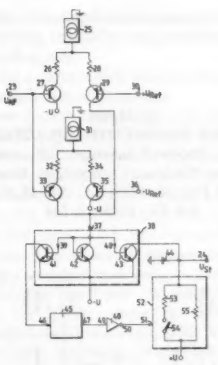
second means for combining the charge packet in the first charge storage cell of the L^{th} stage of said second shift register with the charge packet in the first charge storage cell of the M^{th} stage of said circular shift register, where M is an integer less than N/2 and L=K+M.

4,321,482

CIRCUIT SYSTEM FOR THE GENERATION OF A DIRECT CONTROL VOLTAGE WHICH IS DEPENDENT ON AN ALTERNATING VOLTAGE

Ernst Schröder, Hanover, and Jürgen Wermuth, Stederdorf, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,971
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830784
Int. Cl.[3] H03K *5/159, 5/00*
U.S. Cl. 307—262 10 Claims



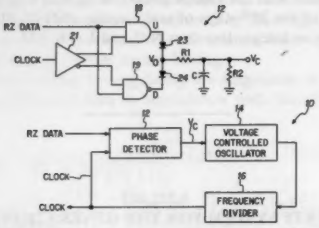
1. In a circuit system for the generation of a direct control voltage dependent upon an alternating voltage for a dynamic compander device, the system including a charging capacitor, a charging circuit connected to charge the capacitor, and a circuit connected to discharge the capacitor, the improvement comprising comparator means connected to effect comparison between the alternating voltage and a reference voltage and to produce an output voltage representative of the amount by which the alternating voltage exceeds the reference voltage, and wherein one of said circuits comprises a current source and an electronically controllable current path connected between said source and said capacitor and having a control input connected to said comparator means for varying the conductance of said current path as a function of the output voltage of said comparator means, and the other of said circuits comprises a current source and an electronically controllable current path connected between its said source and said capacitor and having a control input connected to said comparator means.

4,321,483

APPARATUS FOR DERIVING CLOCK PULSES FROM RETURN-TO-ZERO DATA PULSES

John M. Dugan, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 12, 1979, Ser. No. 84,336
Int. Cl.³ H03L 7/06
U.S. Cl. 307—269 8 Claims



1. Apparatus for deriving clock pulses from data pulses, comprising:

means for sampling the error in phase between a portion of a data pulse substantially away from the edge thereof and an edge of a corresponding clock pulse, and for holding said error; and

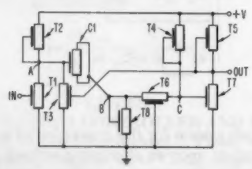
a phase locked loop including means for generating said clock pulses at a frequency dependent on said held error.

4,321,484

FIELD EFFECT TRANSISTOR MULTIVIBRATOR

Eugene M. Blaser, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,261
Int. Cl.³ H03K 3/284
U.S. Cl. 307—273 8 Claims



1. An improved field effect transistor multivibrator having first and second field effect transistors with their source electrodes being connected in common and their drain and gate electrodes being respectively cross-coupled by first and second cross-coupling paths, one of the cross-coupling paths comprising:

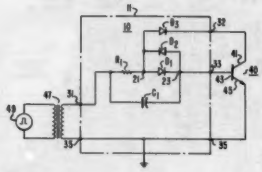
a capacitor and a third field effect transistor connected in series between the drain electrode of said first field effect transistor and the gate electrode of said second field effect transistor, said third field effect transistor having its drain to source path connected between the gate electrode of said second field effect transistor and said capacitor, and having its gate electrode connected to a first fixed potential.

4,321,485

HIGH-FREQUENCY TRANSISTOR SWITCH

Merle Morozowich, Irwin, Pa., and Richard L. Bonkowski, Milwaukee, Wis., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1980, Ser. No. 160,243
Int. Cl.³ H03K 29/90, 17/60
U.S. Cl. 307—300 4 Claims



1. A circuit for switching a transistor in response to a signal, said transistor having a collector, a base, and an emitter, said circuit comprising:

(a) an input terminal for coupling said circuit to said signal, a first output terminal for coupling said circuit to the base of said transistor, and a second output terminal for coupling said circuit to the collector of said transistor;

(b) first and second diode means coupled in anti-parallel between said input terminal and said first output terminal, said first and second diode means each having a reverse-recovery time on the order of 2 μs,

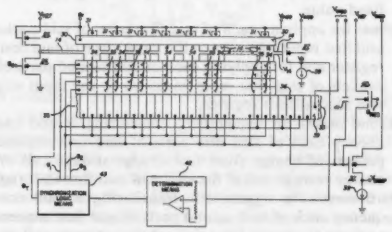
(c) a third diode means coupled between said input terminal and said second output terminal, said third diode having a reverse-recovery time on the order of 200 ns.

4,321,486

PHOTODETECTOR SIGNAL CONTROL IN CHARGE TRANSFER DEVICE IMAGER

Clifford H. Boler, New Hope, Minn., and Dennis J. Wilwerding, Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1980, Ser. No. 123,636
Int. Cl.³ H03K 3/42; H01L 29/78, 27/14, 31/00
U.S. Cl. 307—311 22 Claims



1. A sensor and sensor signal processor device having a plurality of sensing sites at which electromagnetic radiation can be sensed and signals therefrom derived, said device comprising:

a semiconductor material body of a first conductivity type except in selected regions thereof, with said semiconductor material body having a first major surface;

a plurality of input charge-transfer devices each of which has therein at least a first storage well electrode, and each said input charge-transfer device storage well electrode being spaced apart from said first major surface by a first electrical insulating layer;

a first sensor electrode having therein a plurality of selected regions with each said selected region separated from those selected regions adjacent thereto in said first sensor

electrode by at least one joining region also provided in said first sensor electrode, each said first sensor electrode selected region being immediately adjacent to one of said input charge-transfer device first storage well electrodes such that transfers of electrical charge can be directed therebetween, and each said first sensor electrode selected region and each said first sensor electrode joining region being spaced apart from said first major surface by a second electrical insulating layer, said first sensor electrode selected regions being at least at some of said electromagnetic radiation sensing sites;

a first switching means having first and second terminating regions and having a control region therein by which said first switching means is capable of being directed to effectively provide a conductive path of a selected conductivity between said first switching means first and second terminating regions, said first switching means first terminating region being electrically connected to a first terminal means adapted for electrical connection to a first electrical energization means, said first switching means second terminating region being electrically connected to said first sensor electrode; and

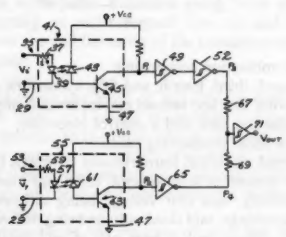
a first buffer means having an output and a high impedance input, said first buffer means input being electrically connected to said first sensor electrode, said first buffer means being capable of providing a representation at said output thereof of any voltage occurring at said input thereof whereby an indication of voltage occurring on said first sensor electrode can be provided in response to selected electromagnetic radiation impingement occurring therethrough at said electromagnetic radiation sensing sites.

4,321,487

COMMON MODE REJECTION COUPLER

Richard B. Huykman, Lincoln Park, N.J., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Apr. 7, 1980, Ser. No. 137,713
Int. Cl.³ H03F *3/45*; G02B *27/00*; H03K *3/42*
U.S. Cl. 307—311 **8 Claims**



1. In a circuit having a common mode voltage between the input and output thereof, a common mode rejection coupler comprising:

a first circuit means for receiving an input signal and for generating a first signal in response thereto, said first circuit means normally isolating said first signal with respect to said common mode voltage;

a second circuit means for receiving the complement of said input signal and for generating a second signal in response thereto, said second circuit means normally isolating said second signal with respect to said common mode voltage, said second signal being the complement of said first signal;

means for inverting one of said first and second signals, said first and second signals being thereby in-phase with one another; and

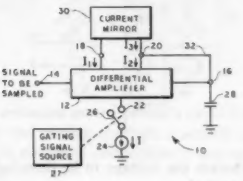
discriminating means receiving said in-phase first and second signals for generating an output signal having first or second states, said discriminating means changing the state of said output signal only when both of said in-phase signals change state, spurious changes in the state of only one of said first and second signals being ineffective to change the state of said output signal.

4,321,488

SAMPLE AND HOLD DETECTOR

Gopal K. Srivastava, Mt. Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 3, 1979, Ser. No. 99,371
Int. Cl.³ G11C *27/02*
U.S. Cl. 307—353 **7 Claims**



1. A sample and hold detector for storing a voltage representative of a sampled portion of an electrical input signal, comprising:

a differential amplifier having first and second signal input ports and first and second current output ports, said differential amplifier being responsive to a difference in voltage levels between its signal input ports for developing, at its current output ports, currents which are a function of said difference;

means for coupling the input signal to the first signal input port;

a storage capacitor coupled to the second signal input port;

means for turning the differential amplifier off and on at a given sampling rate;

means defining a current path between the capacitor and the second current output port; and

current mirror means coupled between the differential amplifier's output ports and responsive to differential amplifier current at the first current output port for sourcing to the second current output port a further current which is a predetermined percentage of differential amplifier current at the first current output port such that, when voltage at the first signal input port exceeds voltage stored on the capacitor, the capacitor receives the further current for charging to a predetermined percentage of the voltage at the first signal input port and the differential amplifier then sinks the further current for holding constant the charge on the capacitor and such that, when the capacitor voltage exceeds the voltage at the first signal input port, the capacitor discharges via the current path and the second current output port toward a predetermined percentage of the voltage at the first signal input port until said current mirror means provides the further current to the second current output port to prevent further discharge of the capacitor.

4,321,489

VOLTAGE DETECTION CIRCUIT

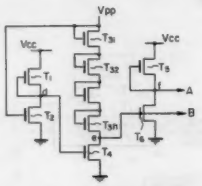
Mitsuo Higuchi, Tokyo; Kazuhisa Nakamura, Sagamihara, and Kohichi Maeda, Yokohama, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Jul. 31, 1979, Ser. No. 62,488
Claims priority, application Japan, Jul. 31, 1978, 53-93501
Int. Cl.³ H03K *17/687, 5/153, 5/24*
U.S. Cl. 307—362 **14 Claims**

1. A voltage detection circuit, for detecting whether a voltage to be detected has a high voltage level or a low voltage level, comprising:

load element group means, having a first terminal and a second terminal, for providing a load;

a transistor, having a control terminal, operatively connected between said second terminal and ground, wherein the sum of the threshold voltages of said load element group means is higher than the low voltage level to be detected and lower than the high voltage level to be detected, said load element group means being kept in an off state when the low voltage level is applied thereto and in an on state when the high voltage level is applied



thereto, wherein the voltage to be detected is applied to said first terminal;

means for supplying a low voltage to said control terminal of said transistor when the voltage to be detected has a high voltage level; and

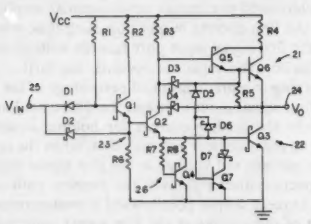
means for supplying a high voltage to said control terminal of said transistor when the voltage to be detected has a low voltage level, so that the voltage to be detected is estimated by a voltage at a connection point between said second terminal of said load element group means and said transistor.

4,321,490

TRANSISTOR LOGIC OUTPUT FOR REDUCED POWER CONSUMPTION AND INCREASED SPEED DURING LOW TO HIGH TRANSITION

Robert W. Bechdolt, Portland, Me., assignor to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Apr. 30, 1979, Ser. No. 34,380
Int. Cl.³ H03K *19/088, 19/084, 19/013*
U.S. Cl. 307—456 **10 Claims**



1. In a transistor logic output device of the type comprising an input and an output for binary data signals of high and low potential, pullup element for sourcing current to the output from high potential, pulldown element for sinking current from the output to low potential, phase splitter element coupled at the input to control the pullup and pulldown elements, said elements comprising junction transistor means, said pulldown element transistor means characterized by relatively large base-collector junction capacitance resulting in undesirable parasitic capacitive feedback Miller current to the base of the pulldown element transistor means during transition from low to high potential at the output of the device, the improvement for diverting and discharging the base-collector capacitive feedback Miller current comprising:

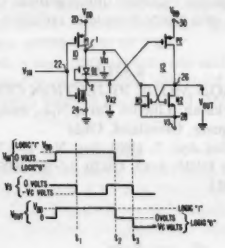
active element transistor means coupled between the base of the pulldown element transistor means and ground or low potential normally defining a high impedance path when the active element transistor means is non-conducting, the base of said active element capacitively coupled to follow the change in potential at the output of the device during transition from low to high potential at the output of the device for capacitive feedback of current to drive the active element to conduction and provide a low impedance path for diverting and discharging capacitive feedback Miller current from the base of the pulldown element thereby enhancing the speed of turnoff of the pulldown element transistor means and reducing power consumption otherwise caused by the undesirable tendency of negative feedback Miller current to maintain the pulldown element in a conducting state, said active element transistor means coupled to the base of the pulldown element transistor means through diode means to prevent the potential level at said base from being pulled too low relative to the level at the device input.

4,321,491

LEVEL SHIFT CIRCUIT

James H. Atherton, Flemington, N.J., and William C. Dreisbach, Baldwinsville, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 6, 1979, Ser. No. 46,049
Int. Cl.³ H03K *5/02, 19/017, 19/094, 3/353*
U.S. Cl. 307—475 **18 Claims**



1. The combination comprising:

first, second, third, fourth, and fifth transistors, each transistor having first and second electrodes defining the ends of a conduction path and a control electrode;

a unidirectional conducting element;

first, second, third and fourth power terminals for the application thereto of first, second, third and fourth voltages, respectively, said first voltage being different than said second voltage, said third voltage being different than said fourth voltage, and at least one of said third and fourth voltages being different than said first and second voltages;

an input signal means;

and an output terminal;

means connecting the conduction paths of said first and second transistors in series with said unidirectional conducting element between said first and second power terminals;

means coupling the control electrodes of said first and second transistors to said input signal means;

means connecting the conduction path of said third transistor between said third power terminal and said output terminal;

means connecting the conduction path of said fourth transistor between said fourth power terminal and said output terminal;

direct current bidirectional conducting means directly connecting the control electrode of said third transistor to the second electrode of said first transistor via a continuously low impedance path and direct current bidirectional conducting means directly connecting the control electrode

of said fourth transistor to the second electrode of said second transistor via a continuously low impedance path;

means connecting the conduction path of said fifth transistor between the control electrode of said third transistor and said third power terminal; and

means connecting the control electrode of said fifth transistor to said output terminal.

4,321,492

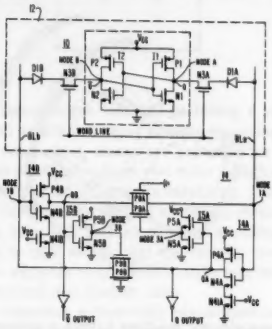
TWO INPUT SENSE CIRCUIT

Richard J. Hollingsworth, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1979, Ser. No. 84,712

Int. Cl.³ H03K *5/18, 3/353, 3/286;* G11C *7/06*

U.S. Cl. 307—530 **17 Claims**



1. A sense circuit comprising:

first and second skewed inverters, each inverter having an input and an output, and each inverter responding to an input transition going from a first voltage level, starting at a reference time, to a second voltage level earlier than it responds to an input transition going from said second level starting, at said reference time, to said first level, where the rise and fall times of the transitions are substantially equal;

two input lines;

means connecting the input of said first inverter to one of said two lines, and means connecting the input of said second inverter to the other one of said two lines;

first means coupling the output of said first inverter to the input of said second inverter and second means coupling the output of the second inverter to the input of the first inverter; and

means responsive to the outputs of said first and second inverters coupled to said second and first means, respectively, for controlling their conductivity and for passing the output signal produced by an inverter whose input undergoes a transition from said first to said second level to the input of the other inverter and causing the output of the other inverter to then go to said second level.

4,321,493

CURRENT TRANSFORMER SUPPORT ASSEMBLY

Jerry D. Wefel, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 2, 1980, Ser. No. 137,080

Int. Cl.³ H02K *11/00;* H01F *15/02*

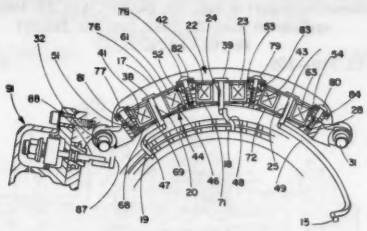
U.S. Cl. 310—68 D **10 Claims**

1. A current transformer support assembly in combination with an electromotive machine that includes an armature secured to a housing, the armature having radially disposed neutral armature conductors, said support assembly including:

an arcuate support member secured internally of said housing, said support member including well shaped means integral with said arcuate shaped support member,

winding means positioned in said well shaped means,

a neutral armature means having a strap secured in a mating manner to said support member, and



said neutral armature means having a neutral lead secured to said strap and passing through a central opening in said winding for electrical connection to said neutral armature conductor.

4,321,494

AIR-GAP WINDING IN AN ELECTRICAL MACHINE

Robert B. MacNab, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

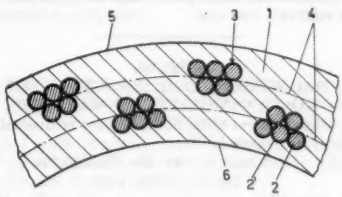
Continuation of Ser. No. 587,618, Jun. 17, 1975, abandoned.

This application Jan. 6, 1977, Ser. No. 757,332

Claims priority, application Switzerland, Jun. 25, 1974, 8656/74

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—179 **7 Claims**



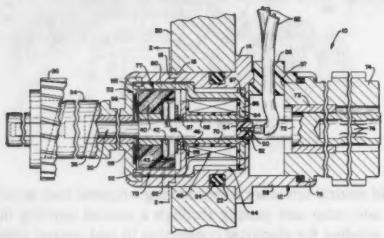
1. An air-gap winding having at least three phases wherein the conductors extending in the axial direction of the machine are embedded in an electrically insulating cylinder which serves as the winding support, the improvement wherein at least some of the conductors are concentrated as conductor bundles which lie at least approximately upon at least one cylindrical surface which extends between the outer and inner surfaces of said winding support and coaxially with the latter and the number of the conductors per conductor bundle is constant along the circumference of said cylindrical surface and wherein the number of conductor bundles on said cylindrical surface is a whole multiple of twice the number of phases, said conductors being located within said electrically insulating cylinder at varying angular distances between two adjacent conductors, at least some of said bundles comprising more than two conductors, each of the conductors being insulated with respect to one another, and wherein at least two phases are carried by the mutually insulated conductors of at least one of said bundles in an other than equal relative arrangement, the conductors of each bundle being proportionately electrically associated with one or more phases of the machine winding in accordance with a distribution function determined according to the harmonic content and the fundamental wave of the electrical machine with respect to the angular position of the bundle.

4,321,495

ROTARY PULSE GENERATOR

Paul L. Kennedy, Meriden, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 142,077, Apr. 21, 1980. This application Mar. 23, 1981, Ser. No. 246,607
Int. Cl.[3] H02K *21/12*
U.S. Cl. 310—156 7 Claims



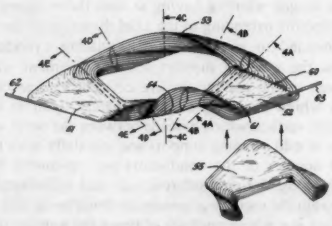
6. In a rotary pulse generator having a rotatable drive shaft, a permanent magnet rotor, coaxially mounted on the drive shaft, having an even plurality of generally equiangularly spaced magnetic poles of alternating polarity, and a pickup mounted in association with the permanent magnet rotor having an annular arrangement of even plurality of stator poles of alternating polarity adjacent the rotor for generating a pulse for each predetermined increment of rotation of the drive shaft, the improvement wherein the permanent magnet rotor is mounted on the drive shaft to have predetermined limited rotation relative thereto for magnetically angularly indexing the rotor relative to the drive shaft through magnetic interaction of the rotor and stator poles when the drive shaft is rotating at a relatively low rate.

4,321,496

DISCOIDAL WINDING COIL STRUCTURE FOR AXIAL GAP DYNAMOELECTRIC MACHINES

John S. Hickey, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,294
Int. Cl.[3] H02K *9/28*
U.S. Cl. 310—179 12 Claims



1. An improved coil structure for a discoidal winding having active coil sides and respective inner and outer end head turn portions for use in an axial gap dynamoelectric machine, said coil structure comprising:

a continuously-wound substantially flat annular disc portion containing first and second active coil sides; and

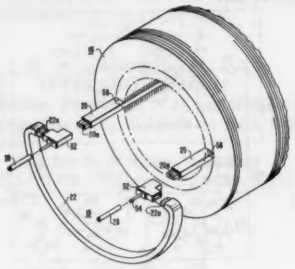
toroidal-shaped inner and outer ring portions formed by the inner and outer end head turns, respectively, of said coil structure with the inner end outer toroidal-shaped ring portions defining the inner and outer circumferential edges of the discoidal winding; said inner and outer toroidal-shaped ring portions being divided into a plurality of complementary, helically-shaped segments that are interfitted to form the complete coil structure having toroidal-shaped inner and outer circumferential ring portions separated by said active coil sides.

4,321,497

PERIPHERAL CONNECTOR RING STATOR END WINDING FOR DYNAMOELECTRIC MACHINES

Lawrence J. Long, Baden, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 10, 1980, Ser. No. 139,083
Int. Cl.[3] H01R *41/08*
U.S. Cl. 310—198 4 Claims



1. A dynamoelectric machine having a generally tubularly shaped stator with a plurality of slots around said stator's inner periphery and a polyphase stator winding disposed therein, said stator winding comprising:

a plurality of bottom coils, each of said bottom coils being generally straight, each of said plurality of bottom coils being disposed within a preselected one of said plurality of slots, said plurality of bottom coils being associated in a generally cylindrical shape coaxial with said generally tubularly shaped stator;

a plurality of top coils, each of said top coils being generally straight, each of said plurality of top coils being disposed within a preselected one of said plurality of slots, said plurality of top coils being associated in a generally cylindrical shape coaxial with said generally tubularly stator and disposed radially inward from said generally cylindrical association of bottom coils;

a plurality of generally C-shaped connectors, each of said plurality of generally C-shaped connectors having a first terminus connectable to a preselected one of said plurality of top coils and a second terminus connectable to a preselected one of said bottom coils;

means for connecting said first terminus to said preselected one of said plurality of top coils;

means for connecting said second terminus to said preselected one of said plurality of bottom coils;

wherein each of said plurality of said bottom and top coils axially extends a preselected distance from said stator;

wherein said preselected one of said plurality of top coils and said preselected one of said plurality of bottom coils extend approximately equal preselected distances from said stator;

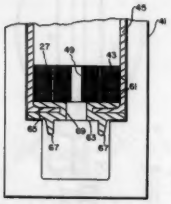
wherein said plurality of generally C-shaped connectors is disposed in a generally cylindrical shape, axially displaced from and generally coaxial with said stator wherein each of said plurality of generally C-shaped connectors has a radius of curvature greater than that of said generally cylindrical association of said bottom coils; and

whereby said plurality of C-shaped connectors are disposed radially outward from said plurality of bottom coils.

4,321,498
SUB-SLOT COVER FOR GENERATOR FIELD

George H. Vogt, Topsfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Apr. 17, 1978, Ser. No. 896,721
Int. Cl.³ H02K *3/34*
U.S. Cl. 310—215 8 Claims



1. In a dynamoelectric machine including a rotor having formed therein axially extending slots for receiving a plurality of electrical conductors, means are provided for electrically insulating said conductors from said rotor body comprising:

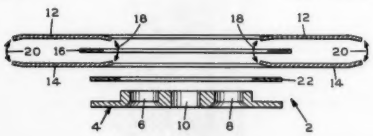
at least one pair of electrically insulating members, each member comprising a radially extending portion terminating in a base leg, said electrically insulating members disposed in each slot so that the radially extending portions are adjacent opposite slot walls and said base legs extend toward one another; and,

an axially extending substantially planar base member having opposite sides formed with axially extending grooves for accepting therein each opposite base leg whereby an interlocking joint is formed between the base member and each of said electrically insulating members.

4,321,499
BRUSH TRACK LAMINATED PRINTED CIRCUIT MOTOR AND ARMATURE

Umesh C. Gupta, Hicksville, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Feb. 29, 1980, Ser. No. 126,010
Int. Cl.³ H02K *1/32*
U.S. Cl. 310—268 7 Claims

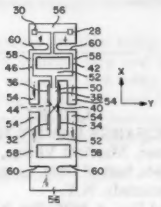


1. An armature disc for axial air-gap, direct current electric motor, said armature disc including a plurality of half turn stamped metal discs, stacked one on the other, the half turns of said metal discs being interconnected and joined at the I.D. and O.D. of said armature disc and forming the turns of said armature, said metal discs being laminated to the opposite surfaces of a laminate disc extending between said metal discs adjacent the I.D. of said armature disc and forming in an area on said laminated metal discs adjacent said I.D. a commutator ring, said armature turns extending radially outwardly beyond said commutator area from the marginal outer edge of said laminate disc.

4,321,500
LONGITUDINAL ISOLATION SYSTEM FOR FLEXURALLY VIBRATING FORCE TRANSDUCERS

Jerome M. Paros, and Donald W. Busse, both of Redmond, Wash., assignors to Paroscientific, Inc., Redmond, Wash.

Filed Dec. 17, 1979, Ser. No. 103,918
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—321 15 Claims

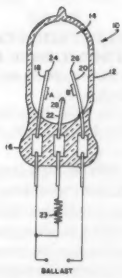


1. In a vibrating beam force transducer having an elongated, resilient beam, drive means for causing said beam to vibrate at a resonant frequency which is a function of the longitudinal force applied to said beam, a pair of mounting pads and mounting means for connecting the ends of said beam to respective mounting pads such that forces applied to said mounting pads toward and away from each other apply longitudinal forces to said beam to vary the resonant frequency of said beam, the improvement comprising longitudinal isolation means associated with said mounting means for facilitating movement of the ends of said beam toward and away from each other responsive to vibration of said beam thereby isolating said mounting pads from longitudinal movement of the ends of said beam while allowing forces applied between said mounting pads to be transmitted to said beam.

4,321,501
LOW WATTAGE, HIGH PRESSURE METAL VAPOR DISCHARGE LAMP FOR MINIMIZING DETRIMENTAL GLOW TIME

George J. English, Reading; Harold L. Rothwell, Jr., Rowley, and William M. Keeffe, Rockport, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 24, 1980, Ser. No. 132,931
Int. Cl.³ H01J *61/073*
U.S. Cl. 313—197 2 Claims



1. In a single ended, short arc, low wattage, high pressure, metal vapor arc discharge lamp having a transparent body defining an arc chamber containing an arc generating and sustaining medium the improvement comprising: first and second main electrodes sealed in a seal area of said body and projecting into said arc chamber, said main electrodes having a given length within said arc chamber and converging

towards each other over a substantial part of said length; an auxiliary electrode sealed in said seal area between said first and second main electrodes and projecting into said arc chamber, said auxiliary electrode having a length less than said given length and being positioned closer to said second main electrode; said converging first and second main electrodes defining therebetween as initial glow region at substantially the height of said auxiliary electrode and an arc region at the terminal ends thereof.

4,321,502

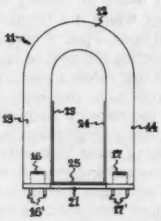
U-SHAPED DISCHARGE LAMP WITH STARTING STRIP

Edward E. Hammer, Mayfield Village, and Eugene Lemmers, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,618

Int. Cl.³ H01J *61/30, 61/54*

U.S. Cl. 313—198 **9 Claims**



1. A U-shaped discharge lamp comprising a bulb shaped to have a pair of substantially straight and mutually parallel legs joined by a U-bend, and starting strip means comprising a pair of conductive starting strips respectively extending along only a portion of said legs, and connector means extending laterally and spatially between and electrically interconnecting said pair of starting strips at corresponding ends thereof, the remaining ends of said starting strips being electrically unconnected.

4,321,503

HID LAMP ELECTRODE COMPRISING BARIUM-CALCIUM NIOBATE OR TANTALATE

Ranbir S. Bhalla, Pine Brook, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 6, 1978, Ser. No. 958,233

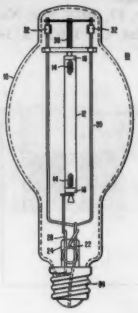
Int. Cl.³ H01J *17/06, 61/06*

U.S. Cl. 313—211 **8 Claims**

1. In combination with a high-intensity vapor-discharge lamp comprising a radiation-transmitting arc tube having electrodes operatively supported therein proximate the ends thereof and adapted to have an elongated arc discharge maintained therebetween, and means for connecting said electrodes to an energizing power source, the improved structure for said electrodes, each of which comprises:

a. an elongated refractory metal member having one end portion thereof supported proximate an end of said arc tube and the other end portion of said metal member projecting a short distance inwardly within said arc tube, an overfitting refractory metal coil means carried on the inwardly projecting portion of said elongated metal member; and

b. electron emissive material carried intermediate turns of said overfitting coil means, said electron emissive material consists essentially of perovskite structured $Ba_3CaM_2O_9$,



wherein: M is niobium, tantalum, or any combinations thereof.

4,321,504

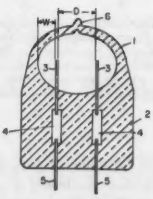
LOW WATTAGE METAL HALIDE ARC DISCHARGE LAMP

William M. Keeffe, Rockport; Harold L. Rothwell, Jr., Rowley, and John A. Scholz, Danvers, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 24, 1980, Ser. No. 132,933

Int. Cl.³ H01J *1/88, 61/30*

U.S. Cl. 313—214 **5 Claims**

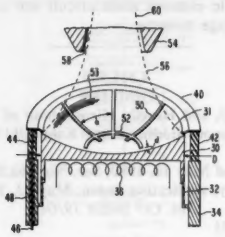


1. A low wattage metal halide arc discharge lamp comprising: an arc tube having a press seal at one end thereof and containing a fill including mercury, a halide and a starting gas; and two main electrodes embedded in said press seal and extending into the arc tube, the distance between the internal tips of the electrodes being a predetermined distance denominated D, the shortest distance between the internal tip of an electrode and the nearest arc tube inside wall being denominated W, the ratio of W/D being greater than 0.4.

4,321,505
ZERO-BIAS GRIDDED GUN

George V. Miram, Atherton, and Gerhard B. Kuehne, Santa Clara, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 927,087, Jul. 24, 1978, Pat. No. 4,227,116.
This application Apr. 14, 1980, Ser. No. 140,073
Int. Cl.³ H01J 29/46
U.S. Cl. 313—447 4 Claims



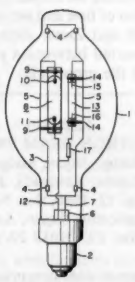
1. A method of modulating a linear-beam of electrons, comprising drawing said beam from a concave electron-emissive cathode surface by an apertured anode at a potential positive to said cathode,

applying a modulating voltage wave form to an electron-permeable grid of conductive elements covering said concave emissive surface and supported insulated from said cathode, the most positive value of said modulating voltage wave form being no more positive than said cathode.

4,321,506
DISCHARGE LAMP AND LIGHTING EQUIPMENT

Michihiro Tsuchihashi, Kamakura; Ryohei Itatani, Kyoto; Masatoshi Ryohko, Akashi, and Yutaka Murai, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,804
Claims priority, application Japan, Dec. 22, 1978, 53/158366
Int. Cl.³ H01J 7/44, 17/34, 19/78; H01K 1/62
U.S. Cl. 315—35 6 Claims



1. A discharge lamp comprising:

a high pressure arc tube for high pressure discharge;

a low pressure arc tube for low pressure discharge;

an impedance element electrically connected in series to said low pressure arc tube;

wherein said high pressure arc tube is electrically connected in parallel to said series connection of said low pressure arc tube and said impedance element;

wherein the relation of the value of the impedance to the conductivity characteristics of said low pressure arc tube and said high pressure arc tube is such that when said high pressure arc tube is conducting, said impedance element prevents said low pressure arc tube from conducting and when said high pressure arc tube is not conducting said impedance element allows said low pressure arc tube to conduct;

a ballast being connected in series with the parallel connection of said high pressure arc tube with said low pressure arc tube and said impedance element;

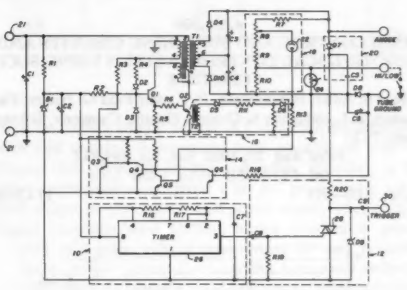
wherein said high pressure arc tube, said low pressure arc tube and said impedance element are assembled in an outer bulb; and

wherein said high pressure arc tube being extinguished by one of a temporary voltage drop and being turned on shortly after being turned off and being incapable of re-starting due to the high pressure in said high pressure arc tube, said low pressure arc tube is immediately started and continues until discharge of said high pressure arc tube is started again.

4,321,507
STROBE POWER SUPPLY

John J. Bosnak, Old Saybrook, Conn., assignor to Austin Electronics, Inc., Deep River, Conn.

Continuation of Ser. No. 962,684, Nov. 21, 1978, abandoned.
This application Jun. 23, 1980, Ser. No. 162,151
Int. Cl.³ H05B 41/29, 41/34
U.S. Cl. 315—241 R 38 Claims



1. Apparatus for delivering current to an intermittently energized load comprising:

power transformer means, said power transformer means including a transformer having at least a primary winding, a secondary winding, a feedback winding, and a drive winding;

solid state switch means, said switch means including a first controllable semiconductor device connected in series with said power transformer means transformer primary winding;

control means for said solid state switch means, said control means including a second controllable semiconductor device connected in series with said power transformer means transformer drive winding, current flow through said second semiconductor device generating a control signal for said switch means;

means for connecting said control means to said switch means whereby the control signals provided by said control means will bias said first semiconductor device to a state of conduction commensurate with that of said second semiconductor device;

means connecting said power transformer means transformer feedback winding to said control means whereby a signal induced in said feedback winding will be delivered as a drive control signal to said control means, said drive control signal controlling the current flow through said second semiconductor device;

means for disabling said control means, said disabling means

when energized removing said drive control signal from said control means whereby said second semiconductor device will be switched to a nonconductive state;

means for sensing the magnitude of current flow through said switch means first semiconductor device and generating a signal commensurate therewith, said current magnitude sensing means including a current transformer having a primary winding connected in series with said power transformer means transformer primary winding and said first semiconductor device, a signal commensurate with current flow through said first semiconductor device being generated in said current transformer secondary winding;

means responsive to said signal commensurate with current flow through said switch means first semiconductor device for providing a first energizing signal to said disabling means whereby said disabling means will cause said control means second semiconductor device to switch to a nonconductive state whenever the current flow through said first semiconductor device exceeds a predetermined level to thereby disable said switch means by removal of a drive control signal therefrom;

means for connecting said series connected transformer means transformer primary winding, said current transformer primary winding and said solid state switch means first semiconductor device across a source of direct current; and

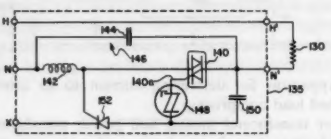
means for connecting a load across said transformer means transformer secondary winding.

4,321,508

LOAD CONTROL AND SWITCHING CIRCUITS AND REMOTE/LOCAL CONTROL SYSTEMS USING SUCH CIRCUITS

Michael S. Adler, Schenectady, N.Y., and Paul G. Huber, Pawtucket, R.I., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,812
Int. Cl.³ H05B *39/04*; G05F *3/04*
U.S. Cl. 315—291 **17 Claims**



1. A system for remotely controlling both the application and magnitude-of-consumption of power to at least one load from an A.C. source, comprising:

a transmission medium;

at least one means for transmitting power-consumption information via said medium;

at least one means for receiving the transmitted power-consumption information;

at least one means associated with each receiving means for providing a control signal having a variable characteristic responsive to the received information; and

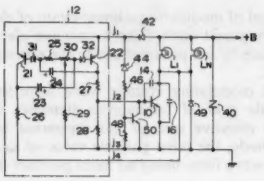
load control and switching means associated with each control signal providing means for connecting and disconnecting the associated one of said at least one load to said source for a portion of each cycle of the source A.C. waveform, the magnitude of said portion being established by said control signal variable characteristic and controlling the magnitude of power consumed by said at least one load; said load control switching means including a gateable bidirectional-conducting element having a gate input and a main circuit, connected between said source and said load, controlled to conduct responsive to a gating signal at said gate input; a trigger element having a first terminal connected to said gate input for providing said gating signal thereto responsive to a voltage of predetermined magnitude at a trigger element second terminal; an energy-storage element connected between said trigger element second terminal and said load; and a silicon controlled rectifier (SCR) having a cathode electrode, a gate electrode and an anode electrode connected to the junction between the energy storage element and trigger element second terminal; one of said cathode and gate electrodes receiving said control signal and the other of said cathode and gate electrodes being coupled to that side of said gateable element main circuit not coupled to said energy-storage element.

4,321,509

DIMMER

Masahiro Miyaji, and Hisashi Hirose, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1980, Ser. No. 150,352
Claims priority, application Japan, May 23, 1979, 54/64468
Int. Cl.³ H05B *39/04*
U.S. Cl. 315—291 **4 Claims**



1. A dimmer comprising:

a dimming transistor connected to a lamp or lamps to be dimmed for controlling an electric current supplied to said lamp,

a switching circuit connected to said dimming transistor for generating pulses having a controllable duty ratio to cause said dimming transistor to turn 'ON' or 'OFF',

surge voltage sensing means having a varistor inserted between a power terminal and grounding, a first diode inserted between the power terminal and power line of said switching circuit, a Zener diode connected at one end to a cathode constituting an output end of said first diode, a series combination of first and second resistors connecting the other end of said Zener diode to grounding, and a second diode inserted between a power control terminal of said lamp and the grounding.

4,321,510

ELECTRON BEAM SYSTEM

Tadahiro Takigawa, Inagi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 22, 1980, Ser. No. 180,439
Claims priority, application Japan, Aug. 24, 1979, 54-107168
Int. Cl.³ H01J *29/58*
U.S. Cl. 315—382 **7 Claims**

1. An electron beam system comprising an electron source section and an image formation section for causing an electron beam from said electron source section to be irradiated onto a subject to be irradiated, said electron source section and said image formation section being arranged so as to be mechanically and optically independent of each other,

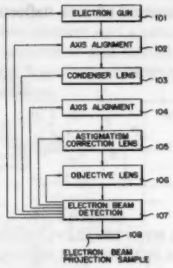
said electron source section including:

a first detecting means for detecting at least one of first controlling quantities for controlling the shape, diameter, brightness and spatial position of a crossover image and the direction of emission of the electron beam emitted from said crossover image; and

a first control means having an electron gun means and an

electron lens means each of which is controlled by said first controlling quantities, said electron lens means being for forming from an electron beam emitted from said electron gun means said crossover image used as an electron source of said image formation section, said first control means controlling at least one of said first controlling quantities by a detection signal from said first detecting means,

said image formation section including:



a second detecting means for detecting at least one of second controlling quantities for controlling the shape and size of an electron beam image which is formed on said subject to be irradiated by using said crossover image as said electron source and the current of an electron beam for forming said electron beam image; and

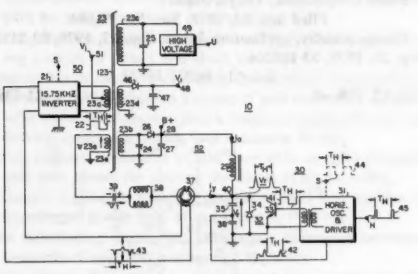
a second control means for controlling at least one of said second controlling quantities by a detection signal obtained by said second detecting means.

4,321,511

LINEARITY CORRECTED DEFLECTION CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1980, Ser. No. 174,864
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—387 **19 Claims**



1. A deflection circuit with linearity correction, comprising:

a source of voltage that includes a deflection rate alternating polarity voltage, said source capable of delivering power during the beginning and ending portions of the trace interval of each deflection cycle;

a deflection winding;

a deflection generator including a source of trace voltage and a trace switch coupled to said deflection winding and responsive to a deflection rate switching signal for applying said trace voltage in series with said deflection rate voltage across said deflection winding during each deflection cycle to generate scanning current in said deflection winding; and

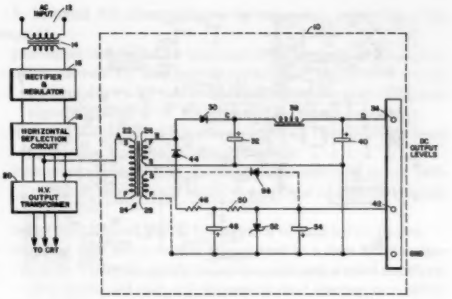
means coupled to said source of deflection rate alternating polarity voltage for phasing said deflection rate alternating polarity voltage relative to said scanning current so as to deliver power from said alternating polarity voltage source during significant periods within said beginning said ending portions in a manner providing substantial linearity correction to said scanning current.

4,321,512

REGULATED VIDEO DISPLAY TERMINAL POWER SUPPLY

Robert J. Alvord, Chicago; Gregory J. Beaumont, Arlington Heights, and Richard J. Steinmetz, Elk Grove Village, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 18, 1980, Ser. No. 179,328
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **9 Claims**



1. A DC power supply for use in a video display terminal in which said terminal is energized by a plurality of level DC voltages, said terminal having a monitor including a high voltage transformers energized with AC power from a horizontal output power source, said power supply comprising:

signal inversion/level shifting means coupled in parallel with said high voltage transformer to said horizontal output power source for receiving horizontal deflection signals and for inverting said horizontal deflection signals and generating a plurality of output signals, each of said output signals being synchronous with said horizontal deflection signals and equal in voltage to a predetermined voltage level;

a plurality of first rectification means coupled to said signal inversion/level shifting means for receiving and rectifying each of said output signals; and

filter means coupled to each of said rectification means for receiving said rectified signals and generating a plurality of low impedance, level voltage, DC outputs each having a voltage level equal to the average value of the rectified signals provided to each of said filter means, for energizing said monitor without switching distortion and for providing said plurality of DC outputs to said video display terminal.

4,321,513

TELEVISION RECEIVER HIGH VOLTAGE PROTECTION CIRCUIT

Peter R. Knight, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 185,454
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **13 Claims**

1. A disabling circuit for a television display system having a high voltage generator that develops a picture tube ultor voltage, comprising:

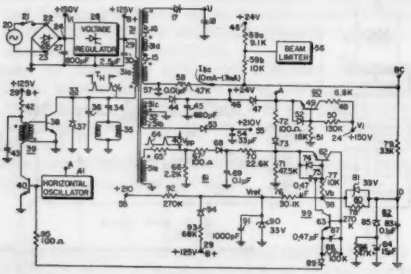
a high voltage generator for developing a picture tube ultor voltage;

means for developing a voltage representative of said ultor voltage;

means for developing a voltage representative of picture tube beam current;

a filter including a first voltage integrating means and a second voltage integrating means having a time constant longer than the time constant of said first voltage integrating means;

means for applying said beam current representative voltage to said filter to develop a filter output voltage representative of the time integration voltage of said beam current representative voltage, said first voltage integrating means operative to develop said time integration voltage when the time integration of said beam current representative voltage is within one range of values;



means coupled to said second, longer time constant, voltage integrating means for activating said second voltage integrating means when the time integration of said beam current representative voltage is within a different range of values indicative of a beam current overload condition that requires the disablement of normal television display system operation, said second voltage integrating means operative to develop said time integration voltage once activated;

a comparator;

means for applying said ultor voltage representative voltage to said comparator;

means for applying said filter output voltage to said comparator, said comparator developing a disabling signal when said ultor voltage exceeds a magnitude that differs with different values of said filter output voltage; and

means coupled to said comparator for utilizing said disabling signal to disable normal television display system operation.

4,321,514

COMMUTATED SCR REGULATOR FOR A HORIZONTAL DEFLECTION CIRCUIT

Leslie N. Thibodeau; David W. Luz, both of Indianapolis, and James E. Hicks, New Palestine, all of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,978

Int. Cl.³ H01J 29/70

U.S. Cl. 315—411 **7 Claims**

1. A regulated deflection circuit, comprising:

a deflection winding;

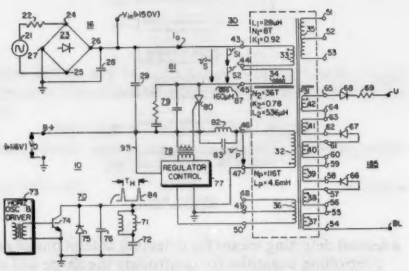
a deflection generator coupled to said deflection winding for generating scanning current in said deflection winding during each deflection cycle, said deflection generator developing a retrace pulse voltage across said deflection winding during a retrace interval of each deflection cycle;

a source of input voltage;

a controllable switch;

a flyback transformer including a first winding having said deflection winding retrace pulse voltage applied thereto for developing retrace pulse voltages across other flyback transformer windings, said flyback transformer including second and third windings coupled in a series arrangement with said controllable switch across said source of input voltage, the magnetic coupling of said third winding with said first winding being less than that of said second winding with said first winding;

control means coupled to said controllable switch for turning on said controllable switch at a controllable instant within a trace interval of each deflection cycle, wherein



input current from said source flows during each deflection cycle in said series arrangement beginning at said controllable instant, and wherein said deflection winding retrace pulse voltage when applied to said flyback transformer first winding produces a decreasing magnitude input current for commutating off said controllable switch within the retrace interval of each deflection cycle; and

means for applying to said control means a signal representative of a deflection circuit energy level for varying said controllable instant to provide regulation of said energy level.

4,321,515

TAPE RECORDER CONTROL SYSTEM

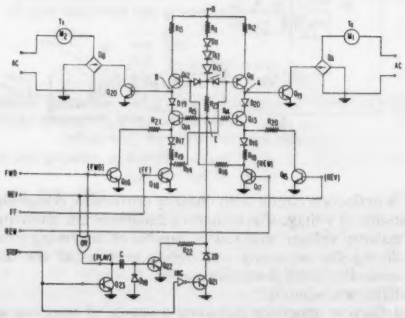
Satoru Honda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 19, 1979, Ser. No. 77,066

Claims priority, application Japan, Sep. 22, 1978, 53-117118; Sep. 26, 1978, 53-118264

Int. Cl.³ B65H 59/38

U.S. Cl. 318—6 **11 Claims**



1. A load driving circuit comprising:

an activatable constant current source including an active output element of a current drive type, said active output element having a control electrode and producing an output current in accordance with the level of bias current provided to said control electrode, said constant current

source further including a first activatable biasing means coupled to said control electrode through a diode for providing a first bias current to said control electrode;

an active element driven by the output current of said output active element for load driving;

a second activatable biasing means coupled to a connection point between said control electrode and said diode, for producing a second bias current for said control electrode of said output active element, said output active element producing an output current sufficiently large to drive said driven active element into a saturated or nearly saturated state in response to said second bias current; and

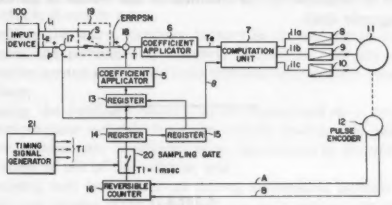
change-over means for selectively activating one of said first or second bias means.

4,321,516

APPARATUS FOR DRIVING SPINDLES OF MACHINE TOOLS WITH INDUCTION MOTORS

Tsutomu Ohtsuka, Fuchu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1980, Ser. No. 168,769
Claims priority, application Japan, Jul. 19, 1979, 54/91993
Int. Cl.³ G05B *19/24*
U.S. Cl. 318—571 **2 Claims**



1. Apparatus for driving a spindle of a machine tool or the like with an induction motor comprising:

pulse generating means coupled to said spindle for generating a series of pulses at a short interval;

a reversible counter for counting the number of said pulses;

gate means which samples a count of said reversible counter with an interval shorter than a response speed of a spindle driving system including said induction motor;

a first register connected to said reversible counter through said gate means for storing the count of said counter;

a second register to which a content of said first register is transferred at the time of sampling;

first calculating means for calculating difference between contents of said first and second registers;

input means delivering a speed instruction signal and an angular position instruction signal of said spindle;

a first adder responsive to said angular position instruction signal and an output signal from said first register for forming a position error signal;

a transfer switch for selecting either one of said speed instruction signal and said position error signal;

a second adder for adding together a signal selected by said transfer switch and an output signal of said first calculating means for forming a torque instruction signal representing a torque to be produced by said induction motor; and

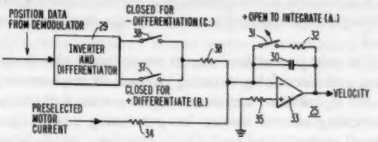
second calculating means for sequentially calculating values of currents supplied to said induction motor based on an output signal of said first register and said torque instruction signal.

4,321,517

RESONANCE SUPPRESSION METHOD

James J. Touchton, Boulder, and John P. Hill, Broomfield, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 3, 1979, Ser. No. 99,988
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—618 **13 Claims**



1. Method for controlling a servo motor comprising the steps of:

providing sensor means responsive to the position of apparatus moved by said servo motor and responsive to the current drawn by said motor and suited for providing first signals indicative of actual position of said apparatus;

deriving a second signal proportional to the rate of change of relative position of said apparatus;

intermittently adjusting starting conditions used in the derivation of said second signal in response to said first signal; and

using said second signal for control of said servo motor;

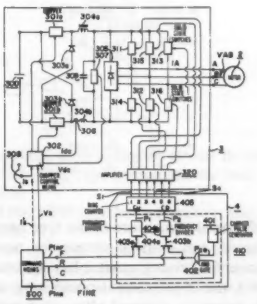
wherein said servo motor is operated in a first accelerative mode, a second steady velocity mode and a third decelerative mode and said adjustments to said starting conditions are not performed during said second steady velocity mode.

4,321,518

INDUCTOR TYPE SYNCHRONOUS MOTOR DRIVING SYSTEM FOR MINUTE CONTROL OF THE POSITION AND THE ROTATION ANGLE OF THE MOTOR

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 671,710, Mar. 29, 1976, Pat. No. 4,134,055.
This application May 25, 1978, Ser. No. 909,493
Claims priority, application Japan, Mar. 28, 1975, 50-38110
Int. Cl.³ H02P *1/46, 5/36;* H02K *37/00*
U.S. Cl. 318—696 **27 Claims**



1. A system for driving an inductor-type synchronous motor for minute control comprising:

an inductor-type synchronous motor having a first means equipped with driving windings of m numbers of phases and first magnetic teeth, and second means equipped with second magnetic teeth face to face with said first magnetic teeth; and

a power feed means for feeding electric power to said driving windings of said m numbers of phases from a DC power source through solid-state switching means interposed therebetween;

wherein said driving windings for one of said phases intersect flux of a portion of said first magnetic teeth and said portion includes at least two magnetic teeth having different fluxes in electrical phase which results in said first means forming a non-distortion electromagnetic construction thereby providing a sinusoidalized internal velocity electromotive force; and

wherein said power feed means comprises a distribution pattern generator for generating patterns in response to a command signal from a system control means, and comprises a switching control device for generating on-off signals for on-off control of said solid-state switching means in response to said pattern; and

said fed electric power being formed into trigonometric-functional patterns by said distribution pattern generator to provide AC components of said fed electric power which has an electric vector rotation angle which is accurately coincident with a balance point of magnetomotive force produced by said driving winding;

whereby minute control is provided which is characterized by an electrical resolution number per electrical angle 2π of said power feed means which is equal or larger than three times m points.

4,321,519

MAGNETIC FIELD DETECTION DEVICE FOR ELECTRONIC TIMEPIECE

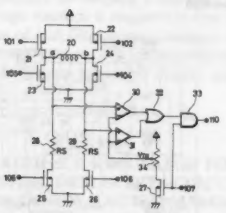
Makoto Ueda; Akira Torisawa; Shuji Otawa; Masaaki Mandai; Masaharu Shida, and Katsuhiko Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,230

Claims priority, application Japan, May 26, 1978, 53-62996

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **8 Claims**



1. In an electronic timepiece of the type having a frequency dividing circuit; and a drive circuit for normally applying effective power for driving a motor having a rotor, a stator and a driving coil, the improvement comprising: detecting means operable to detect an external alternating magnetic field including a coil for developing therein an induced voltage when said coil is placed in an external alternating magnetic field and for producing a detection output signal in response to detection of an alternating magnetic field strength higher than a predetermined magnetic field strength; and control circuit means for effecting the application of an effective power to said driving coil different from the effective power normally applied to said driving coil in response to the detection output signal.

4,321,520

ELECTRONIC TIMEPIECE

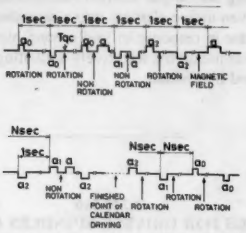
Makoto Ueda; Akira Torisawa; Shuji Otawa; Masaaki Mandai; Masaharu Shida, and Katsuhiko Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 19, 1979, Ser. No. 49,974

Claims priority, application Japan, Jul. 19, 1978, 53/88054

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **11 Claims**


1sec 1sec 1sec 1sec 1sec 1sec
Tqc
ROTATION ROTATION NON ROTATION NON ROTATION ROTATION MAGNETIC FIELD
Nsec
1sec
Nsec Nsec
NON ROTATION FINISHED POINT of CALENDAR DRIVING ROTATION ROTATION ROTATION

1. An electronic timepiece comprising in combination: a stepping motor including a stator, a drive coil and a rotor; drive means for driving the stepping motor in one of at least two different states; and means for changing the state of the drive means in response to a change in the load of the motor and in response to the location of the motor in an external magnetic field.

4,321,521

DETECTION DEVICE OF ELECTRONIC TIMEPIECE

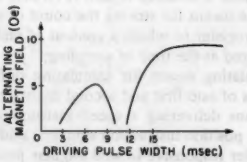
Makoto Ueda; Akira Torisawa; Shuji Otawa; Masaaki Mandai; Masaharu Shida, and Katsuhiko Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,222

Claims priority, application Japan, Dec. 25, 1978, 53-162170; Dec. 26, 1978, 53-161509; Dec. 26, 1978, 53-161510

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **17 Claims**

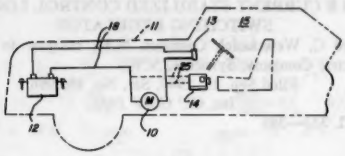


1. A device for use with an electronic timepiece and the like comprising: a stepping motor having a stator, rotor and driving coil; means for generating at least two kinds of driving pulses each effective when applied to the driving coil to rotationally drive the rotor under different operating conditions; means for detecting rotation and non-rotation of the rotor; means for detecting an external alternating magnetic field; and control means for selecting at least one kind of driving pulse for application to the driving coil in response to the detection of rotation and non-rotation of the rotor and the detection of an external alternating magnetic field.

4,321,522
VEHICLE STARTING METHOD

Iwao Matsunaga, Chicago, Ill., assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,306
Int. Cl.³ H02J 7/00; B60L 1/02
U.S. Cl. 320—2 6 Claims



1. The method of starting the engine of a vehicle over a wide range of ambient temperatures including cold temperatures such as below 32° F., and warm temperatures, such as 32° F., and above, said vehicle having an electrically operated starter motor and an effectively permanently installed battery for energizing the starter motor, said method comprising the steps of:

energizing the starter motor from said battery only to start the vehicle at warm temperatures;

providing a small auxiliary battery;

warming said auxiliary battery separate from the vehicle during cold ambient temperature conditions when the vehicle is not in use;

installing the warm auxiliary battery in the vehicle to augment the permanently installed battery to energize the starter motor under said cold ambient temperature conditions;

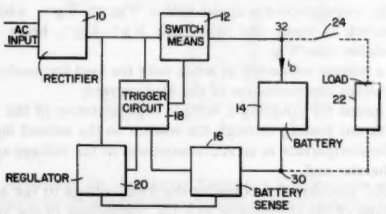
causing the auxiliary battery to be maintained at a warm temperature separate from the vehicle during cold ambient temperature conditions again subsequent to discontinuation of use of the vehicle; and

repeating said last two steps during subsequent periods of use and nonuse of the vehicle during cold ambient temperature conditions.

4,321,523
BATTERY CHARGER AND POWER SUPPLY CIRCUITRY

Ronald O. Hammel, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 5, 1978, Ser. No. 948,739
Int. Cl.³ H02J 7/10
U.S. Cl. 320—14 6 Claims



1. A transformerless AC to DC battery charger circuit having a pair of output terminals, comprising:

rectifier circuit means for converting the AC line to direct current;

semiconductor switching means coupled between the rectifier means and output terminals of the charger circuit for supplying charging pulses;

resistor means connected to the control terminal of the semiconductor switching means;

trigger circuit means coupled to a control terminal of the semiconductor switching means and operable to generate a trigger pulse at a phase joint intermediate the ends of a half wave cycle of the rectified line current for enabling conduction of the semiconductor switching means to produce a charging pulse for the remainder of said half wave cycle;

said trigger circuit means including a relaxation oscillator circuit comprising a resistor/capacitor network and a unijunction transistor whose emitter is connected to the resistor/capacitor network, and whose output is directly connected to the control terminal of the semiconductor switching means through the resistor means;

battery sensing circuit means coupled between the output terminals and trigger circuit means adapted to monitor battery voltage, compare it to a predetermined reference voltage, and generate a signal responsive to the difference between the battery and reference voltages for controlling operation of the trigger circuit means;

a semiconductor element shunting the capacitor of the resistor/capacitor network;

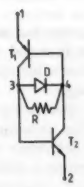
said battery sensing circuit means producing an output signal which controls the conductive state of said semiconductor element which shunts the capacitor of the trigger circuit means, the state of conductivity of the semiconductor element rendering the trigger circuit means either operative whereby phase controlled pulses are impressed to the control terminal of the semiconductor switching means, or inoperative; and

voltage regulator circuitry for regulating the output voltage from the rectifier circuit and for supplying regulated voltage to the trigger and battery sense circuits.

4,321,524
TRANSISTORIZED VOLTAGE LIMITER

Marko Petrovic, Jevremova 25, 11000 Belgrade, Yugoslavia

Filed Oct. 10, 1979, Ser. No. 83,417
Claims priority, application Yugoslavia, Oct. 16, 1978, 2430/78
Int. Cl.³ G05F 3/08
U.S. Cl. 323—229 2 Claims



1. In a two terminal voltage limiter circuit including

a transistor of the PNP type having emitter base and collector electrodes;

a transistor of the NPN type having emitter base and collector electrodes;

the collector of the PNP transistor being connected to the base of the NPN transistor and the collector of the NPN transistor being connected to the base of the PNP transistor; and wherein

said transistors are rendered conductive upon application of a predetermined unidirectional voltage between their respective emitter electrodes, with the positive polarity of said voltage being applied only to the emitter of said PNP transistor and the negative polarity of said voltage being applied only to the emitter of said NPN transistor, the improvement comprising:

a diode having an anode and a cathode and having a prede-

termined conduction characteristic in its forward conducting direction, the anode of said diode being connected in common to the collector of the PNP transistor and the base of the NPN transistor, and the cathode of said diode being connected in common to the collector of the NPN transistor and the base of the PNP transistor;

said diode thereby never being reverse biased and being forward biased when said transistors are in a conductive state;

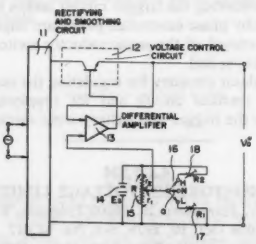
the characteristic of said diode combining with the characteristics of said interconnected transistors to provide a voltage limiting action across the emitter terminals at voltage and current levels substantially lower than the operating ranges of Zener diodes.

4,321,525

REFERENCE VOLTAGE GENERATING CIRCUIT IN A DC POWER SUPPLY

Ryoji Imazeki; Masayuki Hattori, both of Hachioji, and Shigeo Nakamura, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,118
Claims priority, application Japan, Oct. 11, 1978, 53-124957
Int. Cl.³ G05F *1/64*
U.S. Cl. 323—281 **8 Claims**



1. A reference voltage generating circuit in a DC power supply which generates an output voltage, comprising:

a reference voltage source for generating a reference voltage;

a first variable resistor connected in parallel with said reference voltage source at first and second nodes and having a movable contact piece which acts as a tap to provide a tapped reference voltage;

a differential amplifier, operatively connected to said movable contact piece, for detecting a difference voltage between the tapped reference voltage and the output voltage and for generating a differential output signal;

a voltage control circuit, operatively connected to said differential amplifier and responsive to the differential output signal from said differential amplifier, for controlling the output voltage so as to limit the difference between the tapped reference voltage and the output voltage to zero;

a second variable resistor having a first terminal connected to the negative side of said reference voltage source at said second node and having a second terminal;

a third variable resistor having a first terminal connected to the positive side of said reference voltage source at said first node and having a second terminal; and

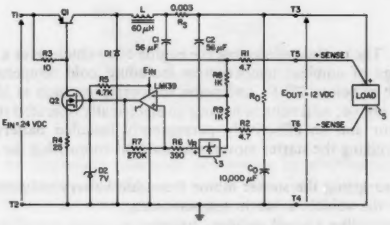
switching means for selectively connecting said movable contact piece of said first variable resistor to the second terminal of said second variable resistor, or to the second terminal of said third variable resistor, or to selectively disconnect said movable contact piece from said second variable resistor and said third variable resistor, so that the tapped reference voltage of said movable contact piece of said first variable resistor is a preset voltage having a magnitude greater than, equal to or less than a predetermined voltage.

4,321,526

RIPPLE CURRENT STABILIZED CONTROL LOOP FOR SWITCHING REGULATOR

Richard C. Weischedel, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Sep. 11, 1980, Ser. No. 186,086
Int. Cl.³ G05F *1/46*
U.S. Cl. 323—286 **3 Claims**



1. In a switching regulator including a switch and an inductor serially connected between a voltage source and a load, the duty cycle of said switch being varied in response to changes in the load voltage to maintain said voltage at a predetermined magnitude, means for controlling the switching frequency and the duty cycle of said switch substantially independently of the load impedance such that feedback loop stability is maintained irrespective of the load reactance and an essentially constant switching period of duration T is maintained despite changes in the load resistance, said means comprising:

(a) a voltage comparator having first and second inputs and having an output electrically connected to the switch, said comparator effecting closing of the switch when a voltage applied to the first input is larger than a voltage applied to the second input and effecting opening of the switch when the voltage applied to the second input is larger than the voltage applied to the first input;

(b) a voltage reference source for applying a voltage V_R, representative of the predetermined load voltage, to the first input of the comparator;

(c) means electrically connected to the first input of the comparator for increasing the voltage on the first input above V_R, to $V_R{+}$, when the switch is closed and for decreasing the voltage on the input below V_R, to $V_R{-}$, when the switch is open, the difference $V_R{+}{-}V_R{-}$, being much smaller than V_R;

(d) a resistor connected in series with the load for producing a voltage representative of the load current;

(e) means for coupling a voltage representative of the ripple current passing through the resistor to the second input of the comparator as an AC component of the voltage applied thereto; and

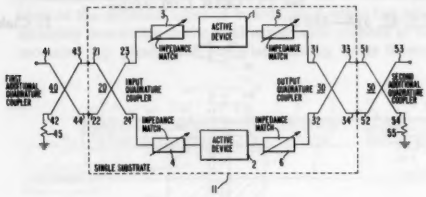
(f) RC circuitry for coupling the load voltage to the second input of the comparator as a DC component of the voltage applied thereto;

the time constant of said RC circuitry being much larger than T so that the change in the DC component during each switching period is much smaller than the change in the AC component, the switching period duration T and duty cycle thus being determined primarily by the rate of change of the ripple current, said rate of change being held essentially constant by the inductor.

4,321,527
APPARATUS AND METHOD FOR INDIVIDUALLY TESTING COMBINED ACTIVE ELEMENTS

Pang T. Ho, Mountain View, Calif., assignor to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Sep. 17, 1979, Ser. No. 75,923
Int. Cl.[3] G01R *27/04*
U.S. Cl. 324—58 A 12 Claims



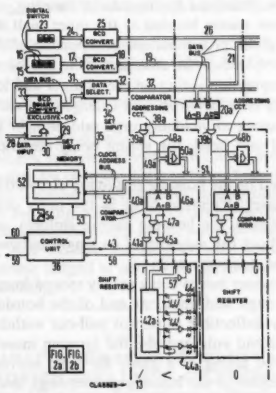
1. Apparatus for independently testing two active components each connected to an input quadrature coupler and an output quadrature coupler, comprising:

a first additional quadrature coupler, connected to said input coupler.

4,321,528
APPARATUS FOR THE DISPLAY OF FREQUENCY DISTRIBUTIONS OF MEASURED VALVES, OR THE LIKE, OVER AN ADJUSTABLE MEASURING RANGE

Hilmar Reichel, Planegg, and Karl-Heinz Hoogen, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,137
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916158
Int. Cl.[3] G01R *23/16*
U.S. Cl. 324—77 D 18 Claims



1. Apparatus for displaying frequency distributions of sequentially-arriving measured quantities over a measuring range which is divided into sections of equal class, the sections being continuously numbered, comprising:

storage means for storing a number of measured quantities which fall into a class;

display means for displaying the stored quantities in each class;

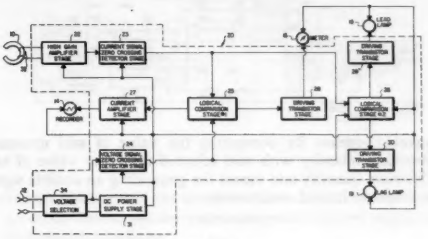
preselection means for selecting the number of total quantities to be displayed; and

up-dating means responsive to receipt of the selected number of quantities to erase the oldest stored quantity and store the newest received quantity.

4,321,529
POWER FACTOR METERING DEVICE

Charles W. Simmonds, 2214 Bryan Cir., Salt Lake City, Utah 84108, and Dennis B. Ardin, 2122 Sahara Dr., Salt Lake City, Utah 84117

Filed Oct. 2, 1979, Ser. No. 81,244
Int. Cl.[3] G01R *25/00*
U.S. Cl. 324—83 R 24 Claims



1. A power factor metering device comprising:

first sensing means for detecting an electrical current;

second sensing means for detecting an electrical voltage;

first indicator means for displaying the magnitude of the power factor derived from the current and voltage detected by said first and second sensing means;

second indicator means for displaying the lead-lag relationship between the detected current and voltage; and

an electronic circuit interconnected between said first and second sensing means and said first and second indicator means, the electronic circuit comprising:

means for scaling said detected voltage so as to accommodate a variety of input voltage levels;

first signal input means for developing a first input signal from said detected current;

second signal input means for developing a second input signal from said detected voltage;

first logic means for deriving a first output signal from said first and second input signals, said first output signal being proportional to the phase angle between said detected voltage and current;

second logic means for deriving a second output signal from said first and second input signals, said second output signal corresponding to the lead-lag relationship between said detected current and voltage;

means for using said first output signal to drive said first indicator means so as to display said power factor;

means for using said second output signal to drive said second indicator means so as to display said lead-lag relationship; and

power supply means for providing power to the various elements of said electronic circuit and said first and second indicator means.

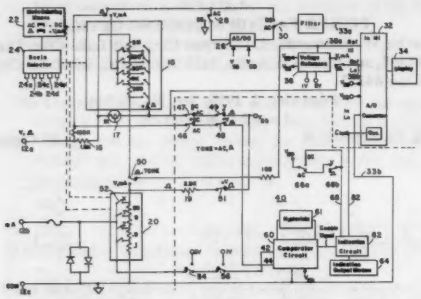
4,321,530
MULTIMETER WITH TONE INDICATION

Austin T. Kelly, Morris Plains; Philip Emile, Jr., Roseland, and Alan H. Stolpen, Union, all of N.J., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Jul. 11, 1979, Ser. No. 56,729
Int. Cl.[3] G01R *15/08, 19/16*
U.S. Cl. 324—115 10 Claims

1. In a meter for measuring an electrical quantity, said meter having a display means and a range selection means defining a plurality of values for said display means for measuring ranges

of values of said electrical quantity, the improvement comprising means coupled to and operative with said range selection means for setting a selected reference value of said electrical



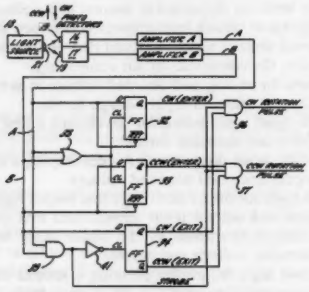
quantity, means for comparing the value of said measured electrical quantity with said selected reference value of said electrical quantity and means for generating an audible signal in response in said comparison.

4,321,531

DIRECTION SENSITIVE PULSE INITIATOR FOR A WATTMETER

Jay K. Marshall, Marietta, Ga., assignor to Sangamo-Weston Inc., Atlanta, Ga.

Filed Sep. 17, 1979, Ser. No. 76,188
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—142 **11 Claims**



1. A pulse initiator for an electrical meter which includes a rotating member whose direction and extent of rotation depends upon the direction and extent of energy transfer in an electrical system to which the meter is connected comprising:

(a) a first and a second sensor each operable to detect an indicium which is borne by the rotating member so that such detection may be by either sensor alone or by both sensors simultaneously;

(b) means for producing unique detector state indications representative of detection by the first sensor, detection by the second sensor and detection by both sensors;

(c) means for decoding the state indications of the means (b) to initiate, when enabled, a pulse indicative of clockwise rotation of the rotating member for a particular detector state indication;

(d) means for decoding the state indication of the means (b) subsequent to said particular detector state indication of the means (c) to determine an exit direction of rotation;

(e) means for decoding the state indication of the means (b) prior to said particular detector state indication of the means (c) to determine an entry direction of rotation; and

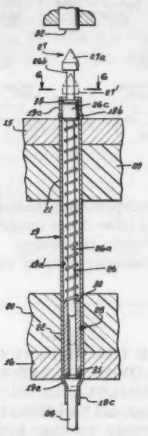
(f) means for enabling the means (c) if the entry direction determined by the means (e) and the most recent exit direction determined by the means (d) are both clockwise.

4,321,532

REPAIRABLE SPRING PROBE ASSEMBLY

L. Jack Luna, 1868 N. Calle Salto, Thousand Oaks, Calif. 91360

Continuation of Ser. No. 887,036, Mar. 16, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 80,134
Int. Cl.³ G01R *1/06, 31/02*
U.S. Cl. 324—158 F **11 Claims**



1. In combination with a tubular housing to be assembled on an insulator board, a spring probe assembly comprising

(a) a vertically and axially elongated plunger and a contact head at one end of the plunger,

(b) the plunger having an enlargement slidably fitting an inner wall defined by the tubular housing,

(c) retainer means located at the inner wall of the tubular housing and proximate one end portion of the housing to releasably retain the enlargement in the housing, and

(d) a compression spring on the plunger and located in said housing bore between said enlargement and structure in the housing to yieldably urge said plunger in a direction toward said head, the spring being electrically conductive,

(e) one end of the housing remaining circularly open across a diameter at least as large as the outer diameter of the enlargement, the housing having uniform, wall thickness throughout the majority of its length between the spring and said open one end,

(f) said retainer means being axially spaced from and accessible through said open one end of the housing, and being radially deflectible to permit pull-out withdrawal of said plunger and enlargement, the housing inner wall at said open end acting as a guide for axial movement of said enlargement in the housing and through said end.

4,321,533

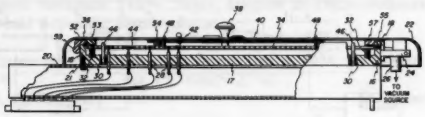
PRINTED CIRCUIT BOARD TEST FIXTURE HAVING INTERCHANGEABLE CARD PERSONALIZERS

John L. Matrone, Guilderland, N.Y., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Continuation of Ser. No. 31,432, Apr. 19, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 213,708
Int. Cl.³ G01R *31/02, 31/22*
U.S. Cl. 324—158 F **13 Claims**

1. A universal fixture system for printed circuit board testing comprising:

a well having side walls and a substantially flat bottom wall;
an array of test probes selectively sufficient for testing each printed circuit board in a family comprising a plurality of different types of printed circuit boards, each test probe mounted through the bottom wall generally perpendicular to it;
a top plate slideably mounted in the well for movement generally perpendicular to the bottom wall, the mounted top plate being one of a like plurality of interchangeable personalized top plates corresponding on a one-to-one basis to the different types of boards, each other top plate slideably mountable in the well in the same manner as the mounted top plate, each top plate having holes formed



through it at locations corresponding on a one-to-one basis both to test points on the corresponding type of board and to selected probes of the test probes, and at least one but not all of the selected probes for one of the top plates being identical to at least one of the selected probes for another of the top plates;
means for securing the mounted top plate at its top side to any particular board under test of the corresponding type of board; and
means for moving the mounted top plate and the particular board toward the test probes to cause each selected probe for the mounted top plate to contact the corresponding test point of the particular board.

4,321,534

MAGNETIC PARTICLE TESTING PROCEDURE INVOLVING PRE-COATING WITH A HYDROPHOBIC COATING

Adolf Mlot-Fijalkowski, Lincolnwood, and Kenneth P. Borrows, Schaumburg, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Mar. 12, 1980, Ser. No. 129,710
Int. Cl.[3] G01N *27/84;* G01R *33/12*
U.S. Cl. 324—216 **6 Claims**

1. A method for testing a magnetizable workpiece for flaws which comprises:
magnetizing said workpiece,
electrostatically applying a coating of finely divided, hydrophobic particles onto the surface of said workpiece,
applying an aqueous suspension of magnetizable particles over the resulting coating, said coating having the property of repelling the water in said aqueous suspension, and
inspecting said surface for magnetizable particles which have become lodged in said flaws against the background of said coating.

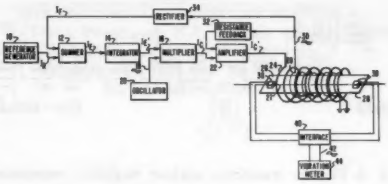
4,321,535

APPARATUS FOR MEASURING DYNAMIC MAGNETOSTRICTION USING ACCELEROMETERS

Jerry W. Allen, Hermitage, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1979, Ser. No. 92,870
Int. Cl.[3] G01B *7/24;* G01R *33/18*
U.S. Cl. 324—209 **13 Claims**

1. An apparatus for measuring dynamic magnetostriction along an axis of a test sample, comprising:
means for producing an adjustable reference signal representative of a desired magnetic field;
means for producing a variable frequency sinusoidal signal;
means for multiplying said reference signal and said sinusoidal signal producing an induction control signal;
means for inducing a variable frequency magnetic field along said axis of said test sample in response to said induction control signal;
means for sensing said induced magnetic field and for producing a feedback signal representative thereof, said feedback signal being input to said induction means such that said induced magnetic field has a uniform sinusoidal waveform;
means for adding said reference signal and said feedback signal producing an indication of the difference between the amplitude of the desired magnetic field and the amplitude of the induced magnetic field such that said induced magnetic field has a constant peak amplitude;



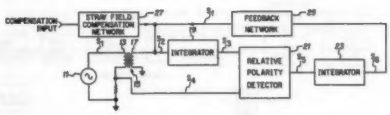
means for holding said test sample without imparting mechanical strain thereto and for maintaining said induced magnetic field spatially uniform;
means for measuring acceleration rigidly mounted on said test sample, said measuring means producing a first electrical signal representative of the acceleration of said test sample due to said induced magnetic field; and
circuit means integrating said first electrical signal producing a second signal representative of the velocity of said test sample due to said induced magnetic field, said circuit means also integrating said second signal producing a third signal representative of the displacement of said test sample along said axis due to said induced magnetic field.

4,321,536

MAGNETIC FIELD DETECTION BY DIFFERENTIAL PHASE LAG

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 22, 1979, Ser. No. 68,840
Int. Cl.[3] G01R *33/04*
U.S. Cl. 324—253 **17 Claims**



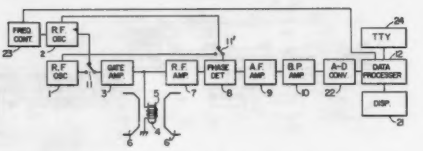
14. Apparatus for detecting magnetic field strength comprising, in combination:
magnetic material means;
source means for applying a bidirectional magnetic flux saturating, alternating excitation signal to said magnetic material means; and
detection means coacting with said magnetic material means and said source means for outputting a magnetic field strength signal as a function of the relative time differential between opposing identical hysteresis loop values.

4,321,537

FOURIER TRANSFORM NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Hiroshi Yokokawa, Katsuta; Chutetsu Hattori, Mito, and Masaaki Takeda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,430
Claims priority, application Japan, Jul. 21, 1978, 53-88451
Int. Cl.³ G01N 27/00
U.S. Cl. 324—312 5 Claims



1. A Fourier transform nuclear magnetic resonance spectrometer comprising:

means for applying a pulse-modulated radio frequency to a sample placed in a magnetic field;

receiving means for detecting a free induction decay signal sent out of said sample through the application of said pulse-modulated radio frequency to produce an audio-frequency free induction decay signal;

arithmetic means for conducting a Fourier transformation on said audio-frequency free induction decay signal delivered from said receiving means to produce a frequency spectrum;

means for detecting a frequency characteristic in a passband of said receiving means to produce a correction coefficient; and

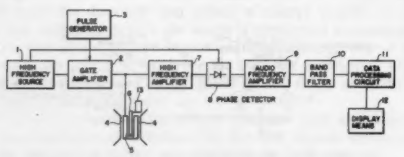
means for arithmetically correcting said frequency spectrum of said sample by the use of said correction coefficient, said frequency spectrum being affected by said frequency characteristic of said receiving means.

4,321,538

NUCLEAR GYROMAGNETIC RESONANCE APPARATUS

Katsunobu Abe, Ibaraki; Satoru Kimura, Isunezumi, and Norimasa Kamezawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1979, Ser. No. 69,057
Claims priority, application Japan, Aug. 31, 1978, 53-107351
Int. Cl.³ G01N 27/00
U.S. Cl. 324—318 12 Claims



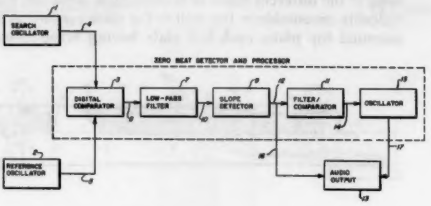
1. A nuclear gyromagnetic resonance apparatus comprising: means for generating a magnetic field; means for generating a high frequency wave; means for placing a sample in said magnetic field; a probe including means for feeding said high frequency wave to said sample and for detecting nuclear gyromagnetic resonance generated thereby; and means for rotating said sample by a predetermined angle while keeping said probe stationary, said means for rotating said sample including means for variably setting said predetermined angle.

4,321,539

DIGITAL BFO METAL DETECTING DEVICE WITH IMPROVED SENSITIVITY AT NEAR-ZERO BEAT FREQUENCIES

Bruce C. Trump, Saint Joseph, Mich., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 16, 1979, Ser. No. 12,850
Int. Cl.³ G01V 3/11, 3/165
U.S. Cl. 324—328 10 Claims



1. A metal detector with a housing, comprising:

first means having electrical characteristics which vary when said first means is in the proximity of either a permeable or conductive substance;

second means for generating a first signal having a nominal frequency dependent upon the electrical characteristics of said first means;

third means for generating a second signal of fixed frequency;

fourth means for comparing said second signal of fixed frequency with said first signal;

fifth means for processing the output of said comparing means to obtain a third signal representing the change in the frequency of said first signal, said third signal indicating the proximity of either a permeable or a conductive substance;

sixth means coupled to said fifth means for processing said third signal to obtain a fourth signal representing the shift of the frequency of said first signal past a predetermined frequency relative to the frequency of said second signal, said frequency shift signal indicating whether the substance detected is either permeable or conductive; and

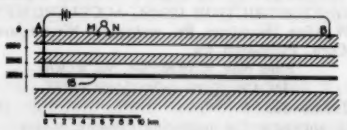
seventh means coupled to said fifth and sixth means for providing audible indications of said third and fourth signals.

4,321,540

ELECTRIC PROSPECTING OF THE SUBSOIL WITH LINEAL ELECTRODES

Francois Gole, Meudon, and Jean-Pierre Rocroi, Massy, both of France, assignors to Compagnie Generale de Geophysique, Massy, France

Filed Aug. 22, 1978, Ser. No. 936,000
Claims priority, application France, Sep. 1, 1977, 77 26559
Int. Cl.³ G01V 3/02
U.S. Cl. 324—357 25 Claims



1. A process for electrical prospecting of subsoil beneath a soil surface, comprising the steps of:

passing an electrical excitation current between two exciter electrodes planted at respective spaced locations relative to the soil surface;

detecting a potential difference between each pair of a plu-

rality of pairs of points near the soil surface and spaced apart from the exciter electrodes; and

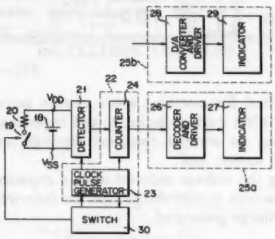
determining, from said detected potential differences, residual anomalies of apparent resistivity of said subsoil,

wherein at least one of the exciter electrodes is a continuous lineal electrode extending a substantial depth into the subsoil from a site near the soil surface, the continuous lineal electrode being in contact with the subsoil over a length corresponding to the depth to which the continuous lineal electrode extends into the subsoil.

4,321,541
CELL CAPACITY DETECTOR

Akihiro Nishizuka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 3, 1979, Ser. No. 99,746
Claims priority, application Japan, Dec. 4, 1978, 53/149046
Int. Cl.³ G01N 27/42
U.S. Cl. 324—426 **10 Claims**



1. A detector for determining the capacity of a cell, said detector comprising:

(a) load means;

(b) switch means between said cell and said load means for connecting and disconnecting said cell from said load means, the connection of said cell to said load means causing said cell voltage to drop; and

(c) means to measure the time for the voltage of said cell to recover from said dropped cell voltage after said disconnection of said cell from said load means.

4,321,542
METHOD AND APPARATUS FOR TESTING CHARGED AND DRY STORABLE LEAD STORAGE BATTERIES

Hans-Joachim Golz, Hanover, and Uwe Bauck, Garbsen, both of Fed. Rep. of Germany, assignors to VARTA Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 17, 1980, Ser. No. 131,025
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913190
Int. Cl.³ G01N 27/42
U.S. Cl. 324—426 **6 Claims**

1. A method for testing lead storage batteries whose electrode plates have been charged but which are dry-storable by virtue of not yet having been filled with electrolyte, said method comprising

establishing between one or more positive and negative electrodes in at least one of the cells, which cells together form a complete battery, a connection which is capable of providing only ion conduction between said connected electrodes, and

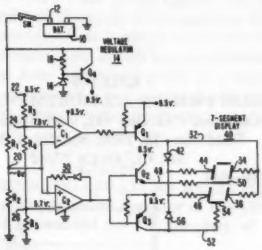
applying a potential measuring instrument across the terminals of the connected electrodes,

whereby the individual cells as well as the complete battery can be tested for polarity, short-circuit and open circuit.

4,321,543
THREE-CONDITION DISPLAY SYSTEM

James W. Tuska, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 139,714
Int. Cl.³ G01N 27/42
U.S. Cl. 324—433 **7 Claims**



1. A high/normal/low three-condition detection and display means, comprising

a first comparator receptive to an upper threshold voltage and to an input signal voltage representing a condition to be displayed,

a second comparator receptive to said input signal voltage and to a lower threshold voltage,

a seven-segment display,

a first circuit coupled from the output of said first comparator to the vertical segments of said display, whereby to energize the vertical ones of the H-representing segments when the input signal voltage exceeds said upper threshold voltage,

a second circuit coupled from the output of said second comparator to the middle horizontal segment of the display, whereby to energize the middle horizontal one of the H-representing segments when the input signal voltage is above the lower threshold voltage, and

a third circuit coupled from the output of said second comparator to the L-representing segments of the display, whereby to energize the L-representing segments when the input signal voltage is below said lower threshold voltage.

4,321,544
METHOD AND IMPROVED APPARATUS FOR OBTAINING TEMPERATURE-CORRECTED READINGS OF ION LEVELS AND READINGS OF SOLUTION TEMPERATURE

John H. Riseman, 6 Holly Ave., Cambridge, Mass. 02138

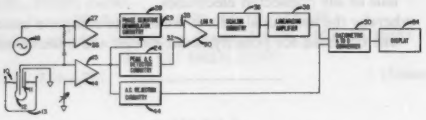
Filed Feb. 19, 1980, Ser. No. 122,001
Int. Cl.³ G01N 27/42
U.S. Cl. 324—438 **17 Claims**

1. Improved ion measurement apparatus comprising:

(a) ion probe for measuring the ion level of a solution;

(b) means for measuring the D.C. potential across said ion probe;

(c) means for measuring said ion probe's electrical resistance;



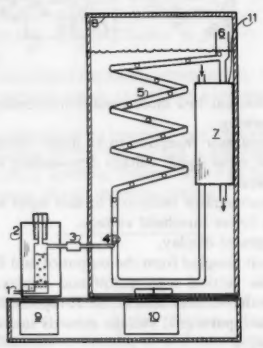
(d) electronic means for determining from the said two measuring means the ion level of said solution corrected for the temperature thereof.

4,321,545

CARBON DIOXIDE MEASUREMENT SYSTEM

James N. Cameron, P.O. Box 742, Port Aransas, Tex. 78373

Filed Mar. 13, 1980, Ser. No. 130,086
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—442 2 Claims



1. A method of obtaining consistent and reproducible results from a CO_2 measuring system whose detection is based on the principal of electrical conductivity change in an alkaline solution, wherein temperature fluctuations, small sample problems, and foaming of liquids are prone to cause error, comprising the steps of:

(a) injecting a sample into an extraction chamber, wherein

(b) an acid solution is employed to convert bicarbonate ion, carbonate ion, and carbonic acid, the usual chemical formulae for which are HCO_3^-, CO_3^{2-}, and H_2CO_3, respectively, to dissolved CO_2 gas,

(c) removal of the CO_2 from the extraction chamber by a carrier gas stream containing no CO_2,

(d) employing the carrier gas stream to conduct the removed CO_2 onto a column wherein it is brought into contact with an alkaline solution, which re-absorbs CO_2,

(e) employing the same carrier gas stream further to circulate the alkaline absorbing fluid first through one cell of a detector, then through a second cell of a detector after absorption of the CO_2 has occurred,

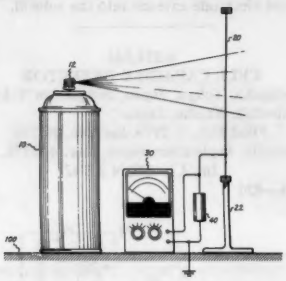
(f) employing analog and digital circuitry to provide an automatically switched counting period, at the end of which the sample concentration is directly displayed.

4,321,546

AEROSOL CAN STATIC ELECTROMETER

Clayton J. Schneider, Jr., East Aurora, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,521
Int. Cl.³ G01R *5/28*
U.S. Cl. 324—457 2 Claims



1. A method for assessing static charge generation by an aerosol container during discharge and including the steps of:

discharging an aerosol container through an electrically isolated screen; and

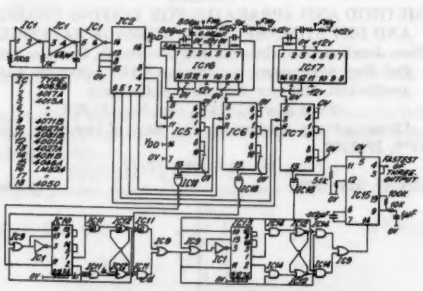
measuring the voltage induced upon a capacitor connected to the screen to thereby permit the determination of the static charge generated.

4,321,547

ELECTRONIC DISCRIMINATION CIRCUITRY FOR THE HIGHEST FREQUENCY OF A PLURALITY OF INPUT SIGNALS

Gordon W. Pickard, Morpeth, and Ian Hayward, Blyth, both of England, assignors to British Gas Corporation, London, England

Filed Dec. 19, 1979, Ser. No. 105,132
Claims priority, application United Kingdom, Jan. 5, 1979, 00476/79
Int. Cl.³ H03K *5/26*
U.S. Cl. 328—133 1 Claim



1. Electronic discrimination circuitry, comprising:

means for converting each of a plurality of at least three analog input signals to respective digital pulse output signals;

multi-phase clocking means for generating a number of multi-phase clocking signals equal in number to the plurality of input signals;

means for synchronizing each of said plurality of at least three analog input signals in response to a respective one of said multi-phase clocking signals for positioning at least the leading edge of each of said digital output signals into

a time slot corresponding to said multi-phase clocking signals;

means for sequentially comparing selected pairs of said synchronized digital output signals to determine within each compared pair thereof that digital output signal having a higher frequency and comparing that digital output signal with another digital output signal until the digital output signal having the highest frequency is selected; and

means for outputting the synchronized digital output signal of highest frequency.

4,321,548

FREQUENCY-VOLTAGE AND VOLTAGE-FREQUENCY CONVERTERS

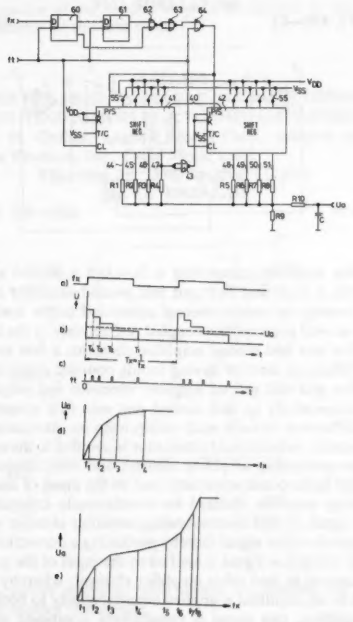
Edmund Jeenicke, Schwieberdingen; Winfried Klotzner, Maulbronn, and Peter Dilger, Markgroningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,357

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900192

Int. Cl.³ H03K *5/01, 13/01*

U.S. Cl. 328—143 **5 Claims**



1. In equipment furnishing an output signal varying in dependence upon the frequency f_x of an applied input pulse sequence, in accordance with a characteristic curve having a break at at least one predetermined frequency f_i, said equipment having a plurality of partial signal supply means (**40**, R_1–R_8) for furnishing partial signals having predetermined amplitudes in response to timing signals applied thereto, and means (R_9) for combining said partial signals thereby creating said output signal:

apparatus for furnishing said timing signals said apparatus comprising cyclically operable means (**1, 2; 26**) for furnishing a sequence of first signals in response to each input pulse in said input pulse sequence; and

means (**5–9; 31, 29**) connected to said cyclically operable means for furnishing said timing signals in response to the one of said first signals occurring at time $Ti = 1/f_i$ following each of said input pulses;

wherein said means for furnishing a sequence of first signals comprises means for furnishing a sequence of counting pulses at a frequency substantially exceeding said frequency of said applied input pulse sequence, and counting means (**1, 2**) connected to receive said counting pulse sequence and said input pulse sequence, for counting said counting pulses from receipt of each of said input pulses and furnishing counting output signals corresponding to the number of so-counted counting pulses, said counting signals constituting said sequence of first signals;

wherein said counting means comprises an address counter (**26**) furnishing address signals corresponding to the number of so-counted counting signals; and

wherein said means for furnishing said timing signals comprises storage means (**31**) connected to said address counter means for furnishing preset signals in response to said address signals, and additional counter means (**29**) connected to receive said preset signals, said input pulse sequence and said counting pulse sequence so that said additional counter means is preset to a count corresponding to said preset signals, counts in a predetermined counting direction from said preset count to a predetermined final count and furnishes one of said timing signals upon reaching said predetermined final count.

4,321,549

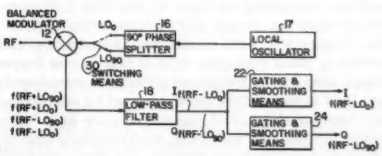
SWITCHING QUADRATURE DETECTOR

James P. Hansen, Waldorf, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1980, Ser. No. 147,413

Int. Cl.³ H03D *3/00*

U.S. Cl. 329—50 **5 Claims**



1. A quadrature detector for providing a pair of quadrature signals from an R.F. signal input comprising, in combination:

local oscillator (LO) means for providing an A.C. signal;

means, connected to receive the LO output signal as an input, for operating on the LO signal to produce two signals therefrom in quadrature phase with each other, designated the I and the Q signals;

switching means, receiving said I and Q signals as inputs, for alternately providing said I and Q signals as a multiplexed output;

modulator means, receiving said multiplexed I and Q signals and said R.F. input signals as a pair of inputs, for combining said pair of inputs to produce at least four signals, two I signals whose frequencies are the sum and difference of the frequencies of the R.F. and the L.O. in-phase signals, and two signals whose frequencies are the sum and difference of the frequencies of the R.F. and the L.O. quadrature-phase signals;

filter means, receiving the output signals of the modulator means, for passing only the two difference-frequency signals, the two difference-frequency signals being in quadrature with each other; and

separation means, connected to receive the output signals of said filter means, for separating the quadrature signals from each other,

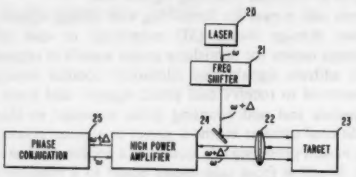
said quadrature detector being arranged to process the quadrature signals through a single channel up to the point at which they are finally separated from each other to provide the I and Q output signals.

4,321,550

PHASE CONJUGATE CORRECTION FOR HIGH GAIN AMPLIFIER SYSTEMS

Viktor Evtuhov, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 22, 1979, Ser. No. 86,872
Int. Cl.³ H01S *3/23, 3/30*
U.S. Cl. 330—4.3 **8 Claims**



1. Apparatus comprising:

oscillator means, disposed along a first optical path for providing coherent light at a first frequency;

optics disposed along said first optical path for focusing said coherent light provided by said oscillator means;

a target disposed along said first optical path at a primary focal plane of said optics;

a laser amplifier disposed along a second optical path for receiving light reflected from said target and processed through a portion of said optics, which transmits, substantially unamplified, light at said first frequency and which amplifies light substantially at a second frequency; and

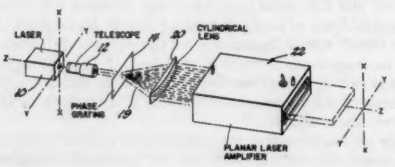
phase conjugation means disposed along said second optical path for responding to light at said first frequency reflected from said target, and for converting light at said first frequency to light at said second frequency, and for providing phase conjugate light at said second frequency which corrects for wavefront distortions introduced into said light at said first frequency caused by said optics and said laser amplifier, said phase conjugate light being directed substantially along said second optical path in the opposite direction back through said laser amplifier for substantial amplification thereof, and through said portion of said optics to said target.

4,321,551

LASER LINE OF LIGHT GENERATOR

Carl E. Biell, Rochester, and Paul J. Epton, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 12, 1980, Ser. No. 159,002
Int. Cl.³ H01S *3/07, 3/10*
U.S. Cl. 330—4.3 **3 Claims**



2. Apparatus for producing a line of continuous uniform intense laser light perpendicular to the direction of light propagation, comprising

a planar laser amplifier having a plurality of parallel laser rods nested together to form a plate, the rods each having a triangular cross-section so that they fit together intimately at adjoining surfaces, and pumping means including a series of linear flashlamps disposed on both sides of the plate,

a laser for producing a beam of light, and

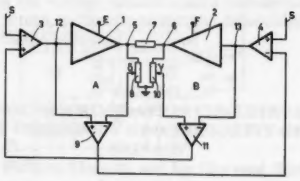
a phase grating in the light beam for producing several light beams of substantially equal intensity and means for combining the beams into a long narrow substantially uniform line of light of continuous intensity in the plane of the said plate and introducing the line of light into the ends of the rods in the planar amplifier to produce an intense substantially uniform and continuous intensity line of light output from the amplifier.

4,321,552

AMPLIFIER COMPRISING A FIRST AND A SECOND AMPLIFIER ELEMENT

Nico V. Franssen; Gerardus A. Van Maanen, both of Eindhoven, and Henricus G. J. M. Kockelmans, Maastricht, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 960,530, Nov. 14, 1978, abandoned.
This application Jun. 2, 1980, Ser. No. 167,262
Claims priority, application Netherlands, Dec. 7, 1977, 7313501
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—81 **15 Claims**



1. An amplifier comprising a first and a second amplifier element; a load; said first and said second amplifier elements each having the output thereof connected to the load; a first and a second preamplifier coupled respectively to the inputs of said first and said second amplifier elements; a first and a second difference circuits having inputs coupled respectively to said first and said second amplifier elements and outputs coupled respectively to said second and said first preamplifiers; said difference circuits each comprising an attenuator and a comparator, wherein said attenuator is coupled to the output of the corresponding amplifier element and said comparator is coupled both to said attenuator and to the input of said corresponding amplifier element for continuously comparing the input signal of said corresponding amplifier element with the attenuated output signal thereby producing a correction signal, which correction signal is applied to the input of the preamplifier coupled to said other amplifier element; whereby when a signal to be amplified is applied simultaneously to both of said preamplifiers, this signal is respectively combined with said correction signals in said preamplifiers and the resultant combined signals thereby become the respective input signals to said amplifier elements.

4,321,553

WIDE BANDWIDTH LOW DISTORTION AMPLIFIER

Gary L. Wagner, Menlo Park, Calif., assignor to Ford Aerospace & Communications Corp., Detroit, Mich.

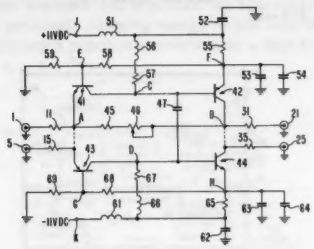
Filed Mar. 21, 1979, Ser. No. 22,584
Int. Cl.³ H03F *3/30*
U.S. Cl. 330—265 **10 Claims**

1. An amplifier comprising:

a first stage having two transistors connected common-base, wherein one transistor is NPN and the other is PNP;

a second stage driven by and connected to said first stage having two transistors, one of which is NPN and the other of which is PNP;

a first d.c. feedback loop connecting the NPN transistor of the first stage with the PNP transistor of the second stage; and



a second d.c. feedback loop connecting the PNP transistor of the first stage with the NPN transistor of the second stage;

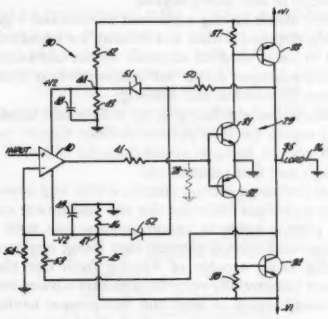
wherein the NPN transistor of the second stage is connected to the PNP transistor of the first stage, and the PNP transistor of the second stage is connected to the NPN transistor of the first stage.

4,321,554

TIME-DELAYED, VARIABLE OUTPUT CURRENT LIMITING MEANS FOR POWER AMPLIFIERS

Patrick H. Quilter, Laguna Beach, Calif., assignor to QSC Audio Products, Inc., Costa Mesa, Calif.

Filed Jan. 14, 1980, Ser. No. 111,687
Int. Cl.³ H03F 3/04
U.S. Cl. 330—298 **16 Claims**



1. A power amplifier with means for limiting the output current thereof comprising:

power output means, having an input and an output, for amplifying signals applied to said input, said output being connectable to a load;

amplification means having a signal input, a signal output coupled to said input of said power output means, and a supply voltage input, the output current of said amplification means being a function of the voltage level at said supply voltage input;

charge storage means coupled to said supply voltage input of said amplification means for establishing a voltage level therefor;

voltage supply means for charging said charge storage means to a desired voltage level sufficient to permit said amplification means to deliver to said power output means a desired maximum current, said voltage supply means being incapable of maintaining said desired voltage level on said charge storage means in the presence of input signals to said amplification means which produce output currents at or near said desired maximum current; and

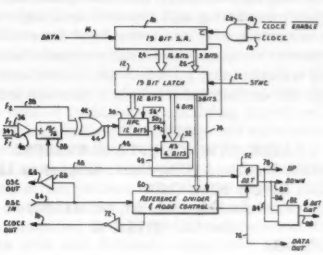
feedback means coupled between said output of said power output means and said charge storage means for feeding a current back to said charge storage means for charging same to maintain said desired voltage level thereon, said feedback means being operative to maintain said desired voltage level only when the impedance of said load is equal to or greater than a desired minimum impedance.

4,321,555

UNIVERSAL FREQUENCY SYNTHESIZER

Max E. Howk, Franklin County; Gale E. Slentz, and Ronald E. Grillot, both of Johnson County, all of Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Apr. 16, 1980, Ser. No. 140,762
Int. Cl.³ H03L 7/00
U.S. Cl. 331—1 A **27 Claims**



1. A universal frequency synthesizer for use in combination with a voltage controlled oscillator operable to generate an output signal having a frequency related to a voltage signal applied to the control input of said voltage controlled oscillator and a reference oscillator operable to generate a reference signal having a preselected reference frequency, said universal frequency synthesizer comprising:

input means for receiving tuning data from an external source;

VCO input means for receiving the output signal generated by said voltage controlled oscillator;

reference oscillator input means for receiving the reference signal produced by said reference oscillator;

phase detector means having a first comparator input and a second comparator input, said phase detector means being operable to compare the frequency of the signal provided to said first comparator input with the frequency of the signal provided to said second comparator input and to produce an output signal which is related to the difference in frequency between the signals provided to said first and second comparison inputs;

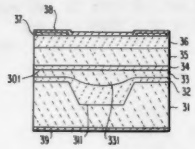
means for coupling said VCO input means with said first comparator input of said phase detector means; and

first divider means for coupling said reference oscillator input means with said second comparison input of said phase detector means, said first divider means being operable to divide the received reference signal by a constant determined by a portion of said tuning data before providing this signal to said second comparison input of said phase detector.

4,321,556
SEMICONDUCTOR LASER

Isamu Sakuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1980, Ser. No. 113,161
Claims priority, application Japan, Jan. 18, 1979, 54-4961; Mar. 15, 1979, 54-30257; Mar. 22, 1979, 54-33739
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 13 Claims

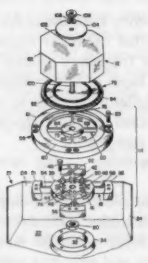


1. In a semiconductor laser comprising an active layer in which light is produced by recombination of injected carriers, a waveguide layer in contact with one surface of said active layer and having a confining effect for said carriers, the thickness of said waveguide layer in a plane perpendicular to the output direction of said light being larger at the inside portion than at the outside portion of said waveguide layer, a first cladding layer contacting with the surface of said waveguide layer not in contact with said active layer for confining said light within said waveguide layer, and a second cladding layer contacting with the other surface of said active layer for confining both said carriers and said light within said active layer.

4,321,557
LASER GYRO COUPLING SYSTEM

Fred McNair, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 21, 1980, Ser. No. 113,901
Int. Cl.³ H01S 3/02
U.S. Cl. 372—33 7 Claims



1. A coupling system for rejecting low frequency motion and transmitting high frequency motion about an axis comprising:

a driving member for transmitting motion about said axis;

a driven member for receiving said transmitted motion about said axis;

said driving member having a first reservoir forming surface about said axis;

said driven member having a second reservoir forming surface about said axis;

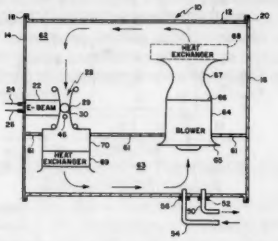
resilient means for closing said first and second surfaces to form a reservoir; and

a viscous fluid located within said reservoir which, at said high frequency, appears as a solid to transmit said high frequency motion and, at said low frequency, yields to said low frequency motion.

4,321,558
RECIRCULATING GAS LASER

Oswald L. Zappa, Stoneham, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Mar. 11, 1980, Ser. No. 129,459
Int. Cl.³ H01S 3/22
U.S. Cl. 372—58 10 Claims



1. In a recirculating flowing gas laser system, the combination comprising:

(a) an outer gas tight housing capable of sealably withstanding a substantial pressure differential between the interior of said housing and the external atmosphere, at least a portion of said housing being sealably removable to provide access to the interior of said housing;

(b) means adapted for connection to a source of lasing medium for introducing a lasing medium into said housing;

(c) means adapted for connection to pumping means for removing gas from the interior of said housing;

(d) means defining a lasing region having a gas inlet portion and a gas outlet portion disposed within said housing for producing lasing action in said lasing region;

(e) means for coupling out of said housing laser energy produced in said lasing region;

(f) blower means having a gas inlet portion and a gas outlet portion disposed within said housing for imparting movement to lasing medium disposed within said housing;

(g) heat exchanger means for removing heat from lasing medium disposed in said housing;

(h) means defining a first plenum within said housing, said lasing region gas inlet portion and said blower means gas outlet portion being in communication one with another through said first plenum; and

(i) means defining a second plenum within said housing, said lasing region gas outlet portion and said blower means gas inlet portion being in communication one with another through said second plenum, said lasing medium in said housing being capable of flowing from one plenum to another substantially only through said blower means and said lasing region, at least said first plenum having a volume providing a lasing medium residence time therein sufficient to provide a low level of turbulence in exiting lasing medium as compared to that of entering lasing medium.

4,321,559
MULTIWAVELENGTH SELF-PUMPED SOLID STATE LASER

Leon Esterowitz, Springfield, Va., and Robert C. Eckardt, Waldorf, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1980, Ser. No. 137,066
Int. Cl.³ H01S 3/16
U.S. Cl. 372—41 6 Claims

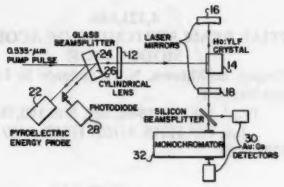
1. An optically-pumped solid-state laser comprising:

a resonant cavity formed by radiation reflective elements opposing each other on a common axis to form a reflective path therebetween, said reflective elements being specially designed to reflect radiation substantially only at or

about certain wavelengths representing a cascade of lasing transitions from at least one upper energy level to an intermediate energy level and from said intermediate level to a lower energy level;

a laser medium disposed in said cavity which lases in at least one upper transition and in at least one lower transition;

means for resonantly pumping energy to said laser medium for producing a population inversion in a high-lying energy state to produce said upper transition; and wherein said reflective elements operate to reflect radiation from said pump laser medium at a wavelength which will sustain stimulated emission at the transition wavelength from said upper energy level to said intermediate level in said cascade and then reflect radiation at a wavelength which will sustain stimulated emission at the transition wavelength from said intermediate level to said lower level in said cascade.

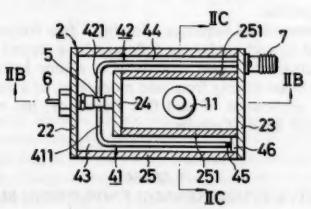


4,321,560

OSCILLATOR USING DIELECTRIC RESONATOR

Toshio Nishikawa, Nagaokakyo; Yoji Ito, Takatsuki; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 20, 1980, Ser. No. 123,015
Claims priority, application Japan, Mar. 1, 1979, 54-24752
Int. Cl.[3] H03B 5/18
U.S. Cl. 331—99 **13 Claims**



1. An oscillator using a dielectric resonator, comprising:

two parallelly extending leakage lines;

an amplifier having an input connected to one end of one of said two leakage lines and an output connected to one end of the other of said two leakage lines, a matching resistor connected to a second end of that one of said leakage lines which is connected to the input of said amplifier;

a dielectric resonator disposed between said two leakage lines at a position which electromagnetically couples said two leakage lines to said resonator and establishes a feedback path between said leakage lines so as to cause said oscillator to oscillate; and

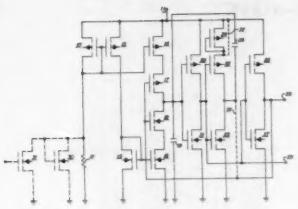
output withdrawing means for withdrawing the output of said oscillator from the output of said amplifier.

4,321,561

SWITCH OPERATED CAPACITIVE OSCILLATOR APPARATUS

Robert L. Payne, Crystal, and Thomas R. Reinke, Robbinsdale, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 28, 1979, Ser. No. 79,907
Int. Cl.[3] H03K 3/353
U.S. Cl. 331—111 **14 Claims**



1. An electronic oscillation circuit capable of providing a periodically varying output signal, said circuit providing:

a threshold capacitance having first and second plate regions;

a switchable current control means having a primary control input region and an output region, said switchable current control means being capable of providing a first selected current through said switchable current control means output region if a signal having substantially a first value is provided to said switchable current control means primary control input region, and being capable of drawing a second selected current through said switchable current control means output region if a signal having substantially a second value is provided to said switchable current control means primary control input region, said switchable current control means output region being electrically connected to said threshold capacitance first plate region with said threshold capacitance second plate region being electrically connected in said circuit to permit to at least some extent passing currents occurring at said switchable current control means output region through said threshold capacitance, said switchable current control means being also electrically connected to a first interconnection means adapted for electrical connection to a first electrical power supply means;

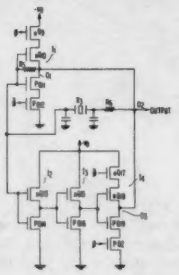
a threshold switch having an input region and an output means, said threshold switch being capable of providing an output voltage of substantially a selected first value at said threshold switch output means if a voltage signal having a value less than a selected first threshold value is provided at said threshold switch input region, and being capable of providing an output voltage of substantially a selected second value at said threshold switch output means if a voltage signal having a value exceeding said first selected threshold value is provided at said threshold switch input region, said selected second voltage value exceeding said selected first voltage value, said threshold switch input region being electrically connected to said threshold capacitance first plate region, said threshold switch output means being electrically connected to said switchable current control means primary control input region, said threshold switch being also electrically connected to a second interconnection means adapted for electrical connection to a second electrical power supply means; and

a coupling capacitance having first and second plate regions, said coupling capacitance means first plate region being electrically connected to said threshold switch output means and said coupling capacitance means second plate region being electrically connected to said threshold capacitance first plate region.

4,321,562
CRYSTAL OSCILLATOR CIRCUIT CAPABLE OF CHANGING THE NUMBER OF INVERTER STAGES COUPLED IN SERIES

Hatsuhide Igarashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1980, Ser. No. 110,715
Claims priority, application Japan, Jan. 11, 1979, 54/3247; Jun. 6, 1979, 54/70982
Int. Cl.³ H03B 5/36
U.S. Cl. 331—116 FE **11 Claims**

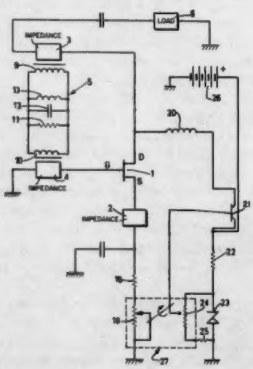


1. An oscillator circuit comprising:
a piezoelectric resonator;
an inverter amplifier having an input portion to which one end of said piezoelectric resonator is coupled and an output portion to which the other end of said piezoelectric resonator is coupled; and
an output terminal coupled to the output portion of said inverter amplifier;
said input portion and said output portion of said inverter amplifier being coupled to a single-stage inverter at the start of oscillation and to plural, odd-numbered stages of inverters cascade-connected with each other substantially after the start of oscillation.

4,321,563
CIRCUIT FOR STABILIZING FREQUENCY OF FET OSCILLATOR AS OUTPUT POWER VARIES

Paul Lesartre, Brunoy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1979, Ser. No. 70,551
Claims priority, application France, Sep. 1, 1978, 78 25304
Int. Cl.³ H03B 5/12
U.S. Cl. 331—117 FE **8 Claims**

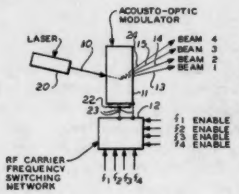


1. A frequency stabilized radio frequency oscillator comprising, a field effect transistor (FET) having drain, source and gate electrodes, an automatic biasing circuit connecting said FET source electrode to ground, a drain voltage supply circuit coupling the FET drain electrode to a source of supply voltage and to ground, a resonant circuit coupled to the FET gate electrode, and means for simultaneously varying in opposite sense a resistance in the automatic biasing circuit and the value of the drain-ground voltage set up by the drain voltage supply circuit.

4,321,564
SEQUENTIAL BEAM SWITCHING OF ACOUSTO-OPTIC MODULATOR

John L. Tregay, Smithtown, N.Y., assignor to Litton Systems, Inc., Melville, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,765
Int. Cl.³ H01S 3/101; H04B 9/00
U.S. Cl. 332—7.51 **10 Claims**



1. An acousto-optic modulator beam switching device for use in recording and display systems comprising:
a source of collimated light;
an acousto-optic modulator;
said source being capable of being beamed at said modulator;
radio-frequency oscillator means capable of providing outputs at a plurality of frequencies; and
switching means coupled to said modulator and to said oscillator means;
said switching means allowing each of said plurality of frequencies to be coupled to said modulator in succession, according to a predetermined sequence;
the application to the modulator of each of said frequencies causing a corresponding deflection in the angle of the beam exiting from said modulator;
said deflected beam having a predetermined power versus time characteristic;
said predetermined sequence allowing a first frequency to be coupled to said modulator followed by a second frequency being coupled to said modulator at a time before the deflected beam exiting from said modulator, as a consequence of the application of said first frequency, has reached its maximum level of power.

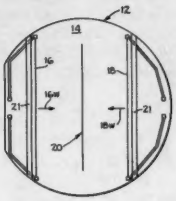
4,321,565
RELATIVE PHASE SENSOR EMPLOYING SURFACE ACOUSTIC WAVES

Robert B. Ward, Mountain View, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jul. 18, 1980, Ser. No. 170,026
Int. Cl.³ H03H 9/68, 9/72
U.S. Cl. 333—150 **7 Claims**

1. A sensor for sensing the delay difference between first and second signals having substantially identical wave forms comprising a piezoelectric body having a surface, first and second interdigital acoustoelectric input transducers disposed on said surface in parallel spaced apart relation to define an active region therebetween, said input transducers being elongated in a first direction and having a length L, means for coupling said signals to respective said input transducers so that surface acoustic waves of a wavelength λ are produced on the action region of said surface, said surface acoustic waves traveling in

a second direction normal to said first direction along said surface between said input transducers so as to interfere with one another in said active region, and a row of n output transducers disposed on said surface in said active region substantially midway between said transducers, wherein n is a positive integer greater than one, each said output transducer being an interdigital electroacoustic transducer having a length approxi-



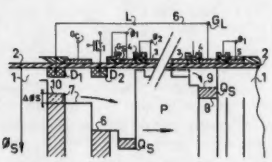
mately equal to L/n, said output transducers being arranged in substantially nonoverlapping relation in said first direction and being offset from one another in said second direction by offset distances each bearing a relation to $\lambda/2$ such that the amplitude of the signal produced at each output transducer by interference between surface acoustic waves from said input transducers represents a discrete delay difference between said first and second signals coupled to said input transducers.

4,321,566

ELECTRIC CHARGE INJECTION AND READING DEVICE AND APPLICATION OF SUCH A DEVICE

Jean L. Berger; Jean L. Coutures, and Pierre Descure, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 1, 1980, Ser. No. 136,373
Claims priority, application France, Apr. 6, 1979, 79 08788
Int. Cl.³ H03H *15/02*; G11C *27/00*
U.S. Cl. 333—165 **9 Claims**



1. A charge transfer device including a charge injection and reading device, comprising a semiconductor substrate covered by an insulating layer on which transfer electrodes are alternated with charge-storage electrodes, these electrodes ensuring on application of given potentials, the transfer of charges in the substrate, wherein at least one charge storage electrode is electrically connected to the source of an MOS saturation-biased charge-injection transistor which is formed from two diodes constituting its drain and its source and from a control grid and which is integrated in a charge-transfer device.

4,321,567

COMBINING SERIES SECTIONS WEIGHTING WITH WITHDRAWAL WEIGHTING IN SAW TRANSDUCERS

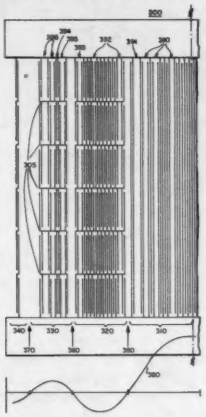
Frank Sandy, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 24, 1980, Ser. No. 133,089
Int. Cl.³ H03H *9/64, 9/25*; H01L *41/04*
U.S. Cl. 333—196 **10 Claims**

1. In combination:

means comprising a substrate for supporting surface acoustic waves;

means for providing a predetermined frequency response on said substrate comprising a plurality of equal width electrodes disposed on a surface of said substrate and arranged in pairs of opposite electrical polarity;



different ones of said electrode pairs having different predetermined electrical weights;

said electrodes having a non-uniform spatial distribution substantially proportional to the time-amplitude characteristics of the impulse response corresponding to said frequency response; and

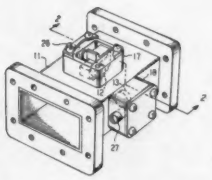
said electrode pairs have substantially uniform aperture.

4,321,568

WAVEGUIDE FILTER EMPLOYING COMMON PHASE PLANE COUPLING

Francis G. Joyal, Groveland, and Chung-Li Ren, Andover, both of Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 19, 1980, Ser. No. 188,904
Int. Cl.³ H01P *1/208, 1/209, 7/10, 7/06*
U.S. Cl. 333—209 **17 Claims**



1. A waveguide filter (FIG. 1 or FIG. 5) comprising a rectangular waveguide (11 or 37) having two broad width and two narrow width waveguide walls and capable of propagating electromagnetic energy therethrough,

a plurality of resonators (12, 13 or 31, 34) each associated with an aperture being located in a waveguide wall for coupling electromagnetic energy to each resonator by partially extending in the waveguide, a first aperture being located in a broad wall of the waveguide and a second aperture being located in a narrow wall of the waveguide, characterized in that

said first and second apertures are positioned within a prescribed phase relationship to the propagating electromagnetic field to provide a filter having reduced length along

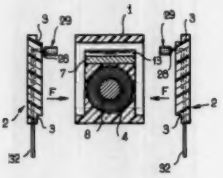
the same direction as the propagating electromagnetic field.

4,321,569

SEALED ELECTOMAGNETIC RELAY

Raymond Bernier, 29 Avenue Foch, 94300 Vincennes, France

Filed Dec. 11, 1979, Ser. No. 102,415
Claims priority, application France, Dec. 15, 1978, 78 36378
Int. Cl.³ H01H *67/02*
U.S. Cl. 335—128 16 Claims



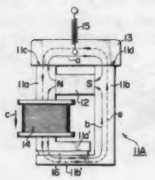
1. In a sealed electromagnetic relay comprising a casing having a number of surfaces and containing driving means comprising a winding and a magnetic circuit for actuating at least one movable conductive strip cooperating with fixed contacts and output connections projecting from the casing, the improvement which comprises at least one surface of the casing having a side plate fitted thereto, conductive bars moulded in the side plate and extending at one end inside the casing to form said contacts and at the other end projecting outside the casing to form a part of the aforementioned connections, said conductive bars having a bend which is disposed within the moulded material of the side plate and penetrating into the interior of the casing perpendicular to the side plate.

4,321,570

RELEASE ELECTROMAGNET

Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Continuation of Ser. No. 912,051, Jun. 2, 1978. This application May 19, 1980, Ser. No. 151,375
Claims priority, application Japan, Oct. 15, 1977, 52/123889; Oct. 15, 1977, 52/138437; Oct. 15, 1977, 52/139423
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—229 24 Claims



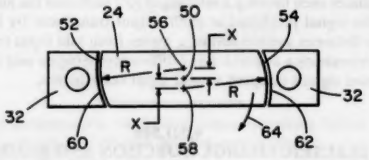
1. In a release electromagnet, including an armature; a first support member; a second support member; a permanent magnet disposed between said first and second support members, one pole of said permanent magnet being attached to said first support member and the other pole of said permanent magnet being attached to said second support member so that a first magnetic flux produced by said permanent magnet passes along a first flux path, including said first and second support members, and attracts an said armature to said first and second support members; electromagnetic means for producing a second magnetic flux which counteracts said first magnetic flux; and bypass means for cooperating with said first and second support members to provide a second flux path, along which a portion of said first magnetic flux passes, and for cooperating with said armature and said first and second support members to provide a third flux path, along which said second magnetic flux passes, said bypass means including a first bypass member, having a first face, and a second bypass member, having a second face adjacent to and spaced from said first face of said first member, the improvement wherein each of said first and second faces has a surface area which is substantially greater than the cross-sectional area of each of said first and second support members, said cross-sectional area being measured in a plane which is generally normal to the direction that said second magnetic flux and said portion of said first magnetic flux pass through said first and second support members, whereby magnetic saturation of said bypass means is inhibited.

4,321,571

ROTARY ACTUATOR WITH SELECTABLE RESPONSE CHARACTERISTICS

Hal G. Meyer, Rockford, Ill., assignor to Precision Governors, Inc., Rockford, Ill.

Filed Nov. 5, 1979, Ser. No. 91,251
Int. Cl.³ H01F *7/14*
U.S. Cl. 335—272 10 Claims



1. A variable position rotary actuator having a selectable response characteristic comprising:

(a) a housing formed of nonmagnetic material,

(b) an output shaft mounted for rotation between first and second positions in said housing and extending therefrom for connection to a device to be controlled by said actuator.

(c) means for biasing said rotor to said first position, out of alignment with said pole pieces,

(d) magnetic circuit means in said housing including: electrical coils, pole pieces associated with said coils, a rotor secured to said shaft for movement therewith, said rotor and shaft being angularly displaceable to a selectable position intermediate said first and second positions by magnetic force when electric current is passed through said coils, said intermediate position being a function of the magnitude of the current passing through said coils,

(e) said rotor and pole pieces having a geometric configuration producing a current versus angular displacement characteristic having three distinct regions including a linear region and regions of increasing and decreasing angular displacement.

4,321,572

NON-CONTACTING POWER TRANSFER DEVICE

Philip A. Studer, Silver Spring, and John Paulkovich, Lanham, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

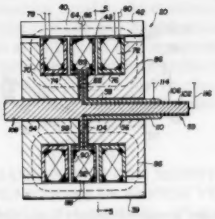
Filed Nov. 13, 1980, Ser. No. 206,506
Int. Cl.³ H01F *15/02*
U.S. Cl. 336—83 11 Claims

1. A rotary transformer (20), comprising:

a magnetic core (39) of magnetically permeable material, having a central axial bore (58), an annular cavity (48) adjacent said axial bore (58), and a continuous transverse channel (68) forming an air gap between said axial bore (58) and said annular cavity (48);

first electrical winding means (70, 72) wound about and in stationary contact with said magnetic core (39);

an electrical winding (88) located in said annular cavity (48), wound on a split bobbin about said magnetic core (39) and rotatable relative to said magnetic core (39) and said first winding means (70, 72) while maintaining a substantially constant flux coupling with said first winding means (70,



72) during energization of said first winding means (70, 72) independently of the positional relation between said rotatable winding and said magnetic core (39);

an electrically conductive coaxial shaft assembly (98 and 107) freely rotatable in said axial bore (58); and

means (96 and 108) for coupling said coaxial shaft assembly (98 and 107) to opposite sides of said rotatable winding (88) through said split bobbin (89).

4,321,573

TRIPPING DEVICE FOR A THERMAL PROTECTION RELAY

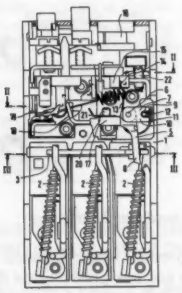
Albert Warnest, Freudenberg, and Friedrich Ebnet, Köfering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 135,121

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914776

Int. Cl.³ H01H *61/00*

U.S. Cl. 337—78 **5 Claims**



1. In a tripping device for a thermal protection relay having a pivoted U-shaped support bracket for a tripping lever which acts on a set of contacts, can be adjusted by means of an adjusting dog, and is connected to a temperature compensation strip, the improvement comprising:

a pair of legs on the support bracket, a crosspiece mounted on the legs, and, reading from the crosspiece in the longitudinal direction of the bracket, support points for the support bracket and for the tripping lever located one behind the other; and

a U-shaped temperature compensation strip, passing around both support points, which is rigidly fastened at one end to the crosspiece of the support bracket and seated at the other end against the adjusting dog.

4,321,574

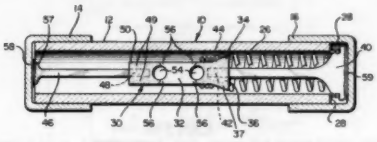
TIME DELAY DUAL ELEMENT FUSE WITH GREATER BLOWING TIME ACCURACY

Andrew L. Pertici, St. Louis, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Oct. 21, 1980, Ser. No. 199,282

Int. Cl.³ H01H *71/20, 85/04*

U.S. Cl. 337—165 **12 Claims**



1. A fuse for protecting an electrical circuit comprising:

a series connected first, second and central conductive elements;

said central element including an elongated body portion with a continuous surface, and body portion connected at first and second ends of said surface to said first and second elements respectively, first and second masses of alloy having a predetermined melting temperature connecting said first and second ends of said body portion to said corresponding first and second elements;

means biasing said central element for circuit opening away from said first element in response to the melting of said alloy masses to a molten state; and

means defined on the surface of said body portion of said central element for restricting the flow of said molten alloy between said first and second ends of said body portion to maintain said alloy masses separated from each other and to prevent reconnection of said central and first elements thereby.

4,321,575

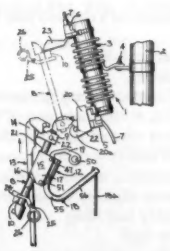
FUSE CUT-OUT RECLOSER APPARATUS

Bernhard Koszewa, Menomonee Falls, and Arthur L. Thomas, Milwaukee, both of Wis., assignors to Milwaukee Safety Devices, Inc., Menomonee Falls, Wis.

Filed Jun. 2, 1980, Ser. No. 155,099

Int. Cl.³ B25B *11/00*

U.S. Cl. 337—168 **13 Claims**



1. A fuse recloser apparatus for inserting a fuse having spaced circuit contacts for connection in a power unit and having a releasable pivotal mount within a fuse holder, said power circuit being subject to creation of hazardous condition upon insertion of said fuse and creating a hazard area adjacent the fuse holder, comprising a fuse shoe unit having clamping means adapted to releasably grasp a fuse, a fuse support, means movably mounting said fuse shoe unit within said support for

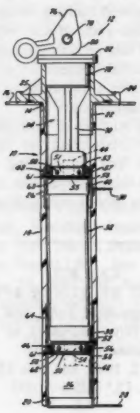
positioning said fuse shoe unit between a holding position and a release position, said support having means coupled with said clamping means to position the shoe unit in said holding position or said release position, an elongated actuator secured to said support and having an outer operating end adapted to be spaced from the support a distance in excess of the hazard area from the fuse holder, and pivotal mounting means for pivotally mounting of the fuse and fuse recloser to said fuse holder and responsive to movement of the actuator to pivot the fuse into the fuse holder.

4,321,576

FUSE HOLDER-UNDER OIL DRYWELL LOADBREAK DEVICE

Wayne W. Lien, Milwaukee, WI, assignor to RTE Corporation, Waukesha, Wis.

Filed Mar. 28, 1980, Ser. No. 134,967
Int. Cl.³ H01H *85/38*
U.S. Cl. 337—202 **16 Claims**



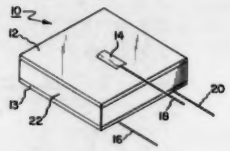
1. The combination of a drywell fuse holder and a loadbreak fuse assembly;
said fuse holder including
a dielectric housing,
first electrical contact means mounted on the inside surface of the housing at the inner end of the housing,
second electrical contact means in said housing spaced outwardly from said first contact means,
first arc-extinguishing means mounted on the inside surface of said housing adjacent to said first contact means;
said fuse assembly including
a non-expulsion fuse
electrical interface means at each end of said fuse for connecting said fuse to said first and second contact means,
second arc-extinguishing means at the inner end of said fuse assembly,
and fuse pulling means connected to the outer end of said fuse for pulling said fuse assembly from said fuse holder whereby said second arc extinguishing means is pulled through said first arc-extinguishing means to extinguish the arc between the fuse and the first contact means.

4,321,577

INTEGRAL HUMIDITY SENSOR/HEATER CONFIGURATIONS

Richard O. Carlson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,133
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—35 **10 Claims**



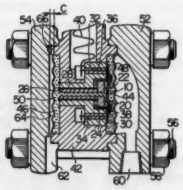
1. A device for sensing ambient humidity comprising:
a fired layer of a composition of magnesium aluminate spinel and titania, said fired layer of said composition comprising a bulk type material with a range of 70 to 90 mol percent of magnesium aluminate and 10 to 30 mol percent of titania;
means adjoining said fired layer for applying heat to said fired layer;
at least one conductor connected to said fired layer; and
at least second and third conductors connected to said means for applying heat.

4,321,578

PRESSURE TRANSDUCER

Akira Nagasu; Yosimi Yamamoto, both of Nakamachi; Takeo Nagata, Hitachi; Hiroyasu Uchida, and Yutaka Sakurai, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,372
Claims priority, application Japan, Oct. 6, 1978, 53-122576
Int. Cl.³ H01L *10/10*
U.S. Cl. 338—42 **6 Claims**



1. A pressure transducer comprising:
a housing;
a semiconductor pressure sensor mounted in said housing;
high-pressure side and low-pressure side flanges fixed to said housing so as to define a high-pressure side space between said high-pressure side flange and one surface of said sensor and a low-pressure side space between said low-pressure side flange and the opposite surface of said sensor, respectively;
a high-pressure seal diaphragm provided in said high-pressure side space to divide said space into a first space to which said one surface of said sensor is exposed and a second space in which a high-pressure fluid is introduced;
a high-pressure side sealed liquid filled in said first space;
means for mounting said high-pressure seal diaphragm such that said high-pressure sealed liquid receives a pressure substantially the same as the pressure of said high-pressure fluid introduced into said second space through said high-pressure seal diaphragm at least until said pressure of said

high-pressure fluid exceeds a pressure value at which said semiconductor pressure sensor may be broken;

a low-pressure seal diaphragm provided in said low-pressure side space to separate it into a third space to which said opposite surface of said sensor is exposed and a fourth space in which atmosphere is introduced;

a low-pressure side sealed liquid filled in said third space; and

a protective member provided in said fourth space and disposed to be normally spaced from said low-pressure seal diaphragm by an amount equal to the maximum permissible deflection of said low-pressure seal diaphragm in response to a high pressure so as to protect said low-pressure seal diaphragm against the force of said high-pressure fluid when said sensor and said high-pressure seal diaphragm are accidentally destroyed by the pressure applied thereto.

4,321,579

CIRCUIT ARRANGEMENT FOR MONITORING OPERATING FUNCTIONS IN MOTOR VEHICLES

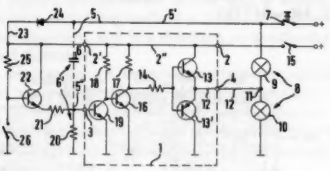
Franz Jochmann, Munich; Helmut Fischer, Planegg; Wolfgang Dietz, Munich, and Olaf Bauernfeind, Germering, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,955

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801954

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **38 Claims**



1. A circuit arrangement for monitoring operating functions in motor vehicles, comprising parallel circuit means each including at least one switching means conducting during normal operating functions, indicating means, comprised of at least a control lamp means and a warning lamp means, for controlling each one of said control lamp means and said warning lamp means to produce an indication only in the absence of an indication produced by the other, test switch means for closing said parallel circuit means, and transmitter means coordinated to the operating functions for automatically triggering said warning lamp means to produce a warning indication with abnormal operating functions.

4,321,580

PROCESS AND APPARATUS FOR ADJUSTMENT OF THE ANGULAR POSITION OF A PART IN ROTATIONAL MOTION

Robert Deleris, Bailly, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 9, 1980, Ser. No. 110,748

Claims priority, application France, Jan. 9, 1979, 79 00386

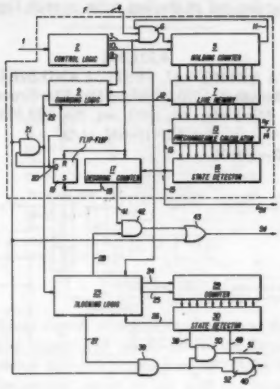
Int. Cl.³ G08C *19/16*

U.S. Cl. 340—870.24 **4 Claims**

1. A method for determining the angular position of a part in rotational motion, comprising the steps of:

providing a disk coupled to said part in rotational motion and rotational therewith, said disk including a plurality of alternating teeth and spaces located about its circumferential periphery, said disk and said part in rotational motion rotating at an angular velocity w;

removing at least one of said plurality of teeth located on said periphery of said disk to form an absolute mark on said disk, said absolute mark being located at a point on the periphery of said disk wherein the ratio



$$\frac{dw/dt}{w^2}$$

is the lowest over the highest number of said plurality of teeth;

providing a position sensor means located in an adjacent relationship to said periphery of said disk, said disk rotating past said position sensor means, said position sensor means detecting the passage of said alternating teeth and spaces and said absolute mark, said position sensor producing an electrical output position signal; and

performing an electronic interpolation on said electrical output position signal in an electronic processor, said electronic processor producing an output signal which represents the angular position of said part in rotational motion for both a constant rotational speed and a variable rotational speed of said part.

4,321,581

POWERLINE CARRIER CONTROL SYSTEM

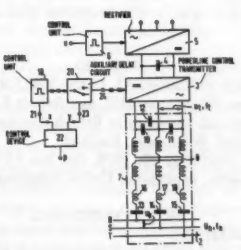
Hermann Tappeiner; Ernst-Robert Paessler, both of Erlangen; Kurt Smutny, Neunkirchen, and Karl-Heinz Krügel, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,085

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810534

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 R **10 Claims**



1. A method for reducing ringing in a coupling network of a powerline carrier control transmitter having a pulsed inverter for generating signals comprising keyed trains of audio output

voltage pulses, the ringing occurring after transmission of the last pulse in each signal train, comprising the steps of:

shifting the output of the transmitter into phase opposition, relative to the phase of the ringing in the coupling network, at the end of the last pulse in each keyed train.

4,321,582

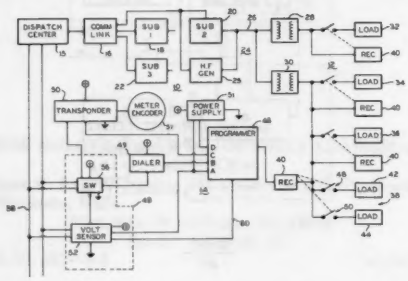
DATA RETRIEVAL SYSTEM AND METHOD

Thomas S. Banghart, 1620 Highland Dr., Elm Grove, Wis. 53122

Filed Mar. 11, 1980, Ser. No. 129,388

Int. Cl.³ H04M *11/02*

U.S. Cl. 340—310 R **7 Claims**



1. In combination, a load management system including means for transmitting command signals from a central location by a first command signal transmission path to one or more receivers located at load stations associated with a power transmission system,

a data retrieval system coupled to the first command signal transmission path, a telephone system extending from said load stations to said central location separate from said first command signal transmission path, said data retrieval system also being coupled to said telephone system,

a data receiver at said central location,

the data retrieval system including a control and a telephone line coupler,

calling means at each of said load stations for completing a signal path through said telephone system to the data receiver at said central location,

a data source, a signal generator coupled to the data source and to the control,

said control being operable to actuate said line coupler upon receipt of a command signal through said first command signal transmission path,

said control being operable to actuate said calling means for calling said data center for establishing a signal path thereto,

said control also being operable upon establishment of the signal path to the data receiver to actuate said signal generator,

said signal generator being operable upon being actuated for providing a signal to the telephone system.

4,321,583

ANALOGUE TO DIGITAL CONVERTER CHANNELS

John R. Baron, Winchmore Hill, and Robert K. Coggan, Luton, both of England, assignors to British Aerospace Public Company, Limited, Weybridge, England

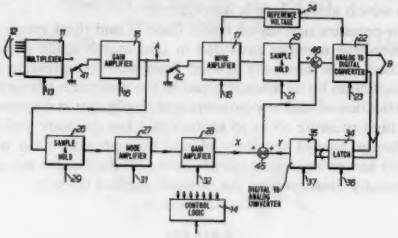
Filed May 30, 1979, Ser. No. 43,705

Claims priority, application United Kingdom, May 31, 1978, 25708/78

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 CC **6 Claims**

1. A signal transmission system including a converter channel having a switched gain amplifier and an analogue to digital converter and a nulling circuit for storing the output from said amplifier when the amplifier has a null input, and a second switched gaine amplifier for amplifying the stored output, and logic means arranged during a subsequent conversion of the analog input, to cause the stored output to be amplified in said second amplifier in sympathy with the analog input for producing a gain-dependant nulling signal and means for adding the gain-dependent nulling signal to the converter channel upstream of the analogue-to-digital converter.



4,321,584

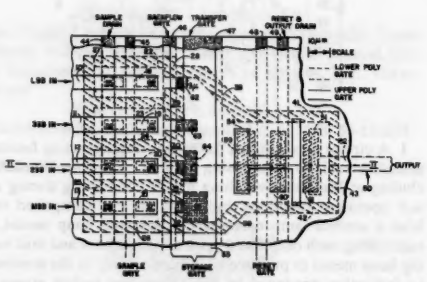
CHARGE COUPLED DIGITAL-TO-ANALOG CONVERTER

Michael J. McNutt, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 15, 1979, Ser. No. 48,960

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **19 Claims**



1. A charge coupled digital-to-analog converter having a plurality of digital input lines with successive significance levels, and an analog output line, comprising:

a body of semiconductor material of a first conductivity type and having a major surface including a plurality of integrated circuit elements;

a first semiconductor region of a second conductivity type adjacent said major surface and extending from said surface to a predetermined depth into said body, said first region forming a plurality of channels in said semiconductor body through which charges can be caused to flow when said circuit elements are appropriately biased;

sample gating means connected to said plurality of digital input lines for simultaneously sampling the digital input bits;

said sample gating means comprising a transistor device implemented on said body of semiconductor materials having its conduction path connected between one of said digital input lines and a corresponding one of said plurality of channels in said body;

a plurality of second semiconductor regions of said first conductivity type adjacent said major surface in each of said channels, said second region having a first conductiv-

ity type forming dopant concentration higher than that of said body;

a plurality of input means connected to respective ones of said second semiconductor regions for applying a predetermined electric charge thereto;

an ordered plurality of third semiconductor regions of said first conductivity type in said semiconductor body adjacent said major surface and located at the termination of said first plurality of channels, said third region having a first conductivity type forming dopant concentration higher than that of said body but less than that of said second semiconductor regions;

said third semiconductor regions forming a plurality of storage wells, each of said storage wells functioning to store a predetermined amount of electronic charge in the form of a charge packet, the location of said storage wells and said amount of electronic charge being defined by the relative locations of a first edge formed by a single transfer gate overlying said body of semiconductor material, said single transfer gate including a plurality of notches, each notch corresponding to a different one of said storage wells, the normal projection of each notch into said semiconductor body defining a peripheral edge of said respective storage well; and a second substantially linear opposite edge, formed by a single backflow gate overlying said body of semiconductor material, said amount of electronic charge corresponding to the bit significance of the corresponding input bit lines;

each of said ordered third semiconductor regions having a cross-sectional area measured in a plane parallel to said major surface which increases with each successive ordered region, the dimension of said area in which successive region increasing both in a direction parallel to said channel direction, and in a direction perpendicular to said channel direction;

a fourth semiconductor region of said first conductivity type in said semiconductor body adjacent said major surface and disposed adjacent said third semiconductor region, said fourth region having a first conductivity type forming dopant concentration substantially the same as said second region; and

biasing means to cause charge flow through said channels, said biasing means including first transfer means for transferring charge from each of said second semiconductor regions to respective ones of said third semiconductor regions during a first time interval until charge equilibrium has been established; and second transfer means for substantially simultaneously transferring charge from each of said third semiconductor regions to said fourth semiconductor region during a second subsequent time interval thereby accumulating the charge from all of said charge storage regions.

4,321,585
INTERPOLATIVE DIGITAL-TO-ANALOG CONVERTER FOR LINEAR PCM CODE

Hiroshi Kosugi, Yokohama, and Kunio Imai, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

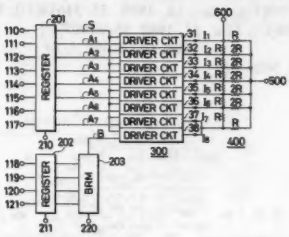
Filed Aug. 23, 1979, Ser. No. 69,063

Claims priority, application Japan, Aug. 23, 1979, 53/114652[U]

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **5 Claims**

1. A digital-to-analog converter for decoding a linear PCM code comprising storage means having a plurality of input and output terminals for temporarily storing a multi-bit digital input signal in the form of a linear PCM signal including a first group of less-significant bits and a second group of more-significant bits, means connected to the output terminals of the storage means for receiving signals of said first group of bits of said digital input signal and for developing said signals into a train of 1-bit signals on a time axis, a ladder resistance network having respective segments corresponding to the bits of the second group of bits of said digital input signal, a group of driver circuits which are connected between the output terminals of said storage means and said ladder resistance network and which receive the signals of the second group of bits of said digital input signal and drive the corresponding segments of said ladder resistance network with these signals, and an



additional driver circuit which is connected to the output of the developing means and which drives the segment of said ladder resistance network corresponding to the least significant bit of the second group of bits with the output signal of said developing means.

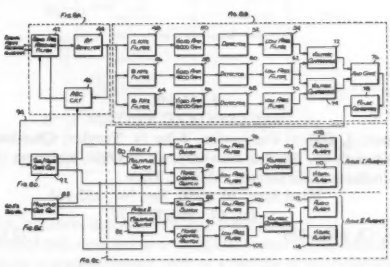
4,321,586
ARTICLE THEFT DETECTION

Michael N. Cooper, Flushing, and Peter A. Pokalsky, East Meadow, both of N.Y., assignors to Knogo Corporation, Hicksville, N.Y.

Filed Aug. 21, 1980, Ser. No. 180,101

Int. Cl.³ G08B *13/18*

U.S. Cl. 340—572 **20 Claims**

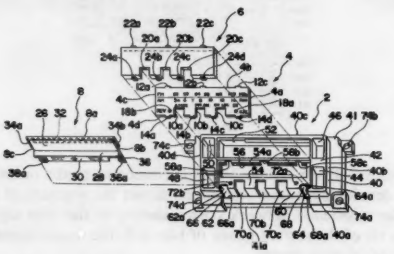


1. A method of detecting the unauthorized carrying of protected articles through an interrogation zone wherein targets affixed to articles being carried through the zone cause electromagnetic field disturbances which, when received, result in target produced electrical signals having a predetermined spectral characteristic and wherein noise is also present in said interrogation zone in the form of electromagnetic field disturbances which, when received result in noise produced electrical signals of different predetermined spectral characteristics, said method comprising the steps of receiving said electromagnetic field disturbances to convert same to said target and noise produced electrical signals, applying said electrical signals to at least three frequency selective channels in parallel, each channel being tuned to pass a different frequency within the target produced signal spectrum, comparing the output signal amplitudes from the channels to ascertain their relative values and producing a detection signal when the relative values of the compared signal amplitudes correspond within a predetermined range, to the corresponding relative values of target produced signals.

4,321,587
DISPLAY UNIT WITH A REMOVABLE INDICATOR PANEL

Susumu Shirasaka, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 4, 1980, Ser. No. 137,493
Claims priority, application Japan, Nov. 20, 1979, 54/161399[U]; Mar. 10, 1980, 55/31618[U]; Mar. 10, 1980, 55/31619[U]; Mar. 11, 1980, 55/31907[U]
Int. Cl.³ G09F 3/14
U.S. Cl. 340—381 19 Claims

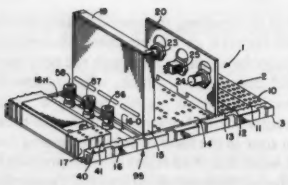


1. A display unit comprising a casing having an opening and a removable panel adapted to be mounted in said opening, said casing having a recess formed in a portion of the edge defining said opening and further having a means for detachably engaging a slidable support plate which can be inserted into and extracted from the casing, said removable panel having a projection extending outwards from a portion of the perimeter thereof and engageable in said recess, said removable panel being mounted in said opening in the casing with said projection engaged in said recess.

4,321,588
BREADBOARD SYSTEM

Robert J. Gabor, Painesville; John N. Tengler, Chardon, and Kenneth W. Braund, Newbury, all of Ohio, assignors to A P Products Incorporated, Mentor, Ohio

Filed Mar. 20, 1980, Ser. No. 132,146
Int. Cl.³ H02B 1/04
U.S. Cl. 340—381 73 Claims

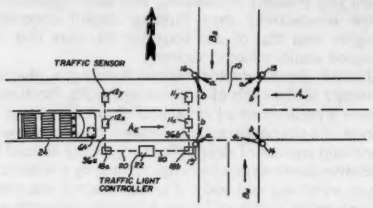


1. A breadboard assembly apparatus to facilitate connecting electrical circuits, comprising a breadboard member including a housing, plural electrical contacts in said housing, openings in at least one surface of said housing for permitting access for connection to respective contacts; and a tray for adjustably holding at least one member in operative position therein; said tray and member including mechanically interengagable means for securing said member in said tray against substantial relative movement in at least one direction, and said tray being of a size adequate to hold a plurality of said members.

4,321,589
DETECTION SYSTEM FOR EMERGENCY VEHICLES WITH SIGNAL PREEMPTION MEANS

Frederick N. King, P.O. Box 601, South Pasadena, Calif. 91030

Filed Jul. 7, 1980, Ser. No. 166,023
Int. Cl.³ G08G 1/07, 1/01
U.S. Cl. 340—38 L 13 Claims



1. Apparatus for indicating the presence of an emergency vehicle as distinguished from other non-emergency vehicles and the like comprising:

means for generating an identifiable alternating magnetic field that radiates from emergency vehicles with a predetermined, fixed frequency outside the frequency band of alternating magnetic fields surrounding non-emergency vehicles in the 90 Hz to 6 KHz frequency band associated with the pulsating ripple DC current flowing in an electrical system and metallic mass of all motor-driven objects having a rotational electrical generating device driven by the motor to supply necessary current to drive the electrical system of the motor-driven object when the motor of the motor-driven object is operative;

means for detecting the identifiable alternating magnetic field radiating from emergency vehicles with a predetermined frequency as that of an emergency vehicle as distinguished from alternating magnetic fields in the 90 Hz to 6 KHz band radiating from all motor-driven objects generated by pulsating DC current supplied to the electrical system of the motor-driven object by a rotational electrical device driven by the motor of the motor-driven object when the motor is operative;

said means for generating an identifiable alternating magnetic field radiating from an emergency vehicle comprising an AC current generator coupled through an output electrical circuit to an alternating magnetic field radiating source such as the metallic mass incorporated in the motor, body and frame of the emergency vehicle;

said AC current generator connected through a switch and input electrical circuit to a battery circuit of the emergency vehicle as a constant power source to drive an AC current generator which is connected through an output electrical circuit to cause current of a predetermined frequency to flow through the output circuit including body and frame of the emergency vehicle;

said means for detecting the identifiable alternating magnetic field radiating from emergency vehicles with a predetermined frequency comprising means for coupling said detection means to the identifiable changing magnetic field radiated by a flow of alternating current in said AC current generator output circuit installed on emergency vehicles for the purpose of identification;

said coupling means comprising a signal developing means and an electric probe connected through an electrical connection to the input of said signal developing means to continuously detect the presence of an emergency vehicle in close proximity to said coupling means independently of whether the emergency vehicle is in motion;

said signal developing means comprising an electrical filter, signal amplification means, signal detection means and an indicating means all connected in sequence;

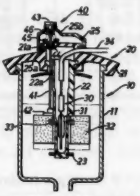
said detection means converts the AC signal to a voltage

level suitable to drive the indicating means which indicates the presence of an emergency vehicle at said electrical probe.

4,321,590
CHECK MECHANISM FOR FLUID LEVEL WARNING DEVICE IN FLUID RESERVOIRS

Masakazu Ishikawa; Harumi Ohori, and Takashi Kiriyama, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 5, 1980, Ser. No. 175,590
Claims priority, application Japan, Aug. 8, 1979, 54/109092[U]
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—515 **2 Claims**



1. In combination with a fluid reservoir which comprises a casing for storing an amount of fluid; a seal cap coupled with an upper opening of said casing to close the interior of said casing and including a tubular member secured at its upper end to the inner wall of said seal cap and extending downward into the fluid in said casing; a float positioned in said casing for movement in a vertical direction in response to variations in the level of fluid in said casing; and switch means including a permanent magnet secured to said float and a magnetically operable switch mounted within said tubular member such that said switch is closed by the magnetic force of said magnet when said float is at a predetermined position, whereby a warning signal is issued when said float moves down to a lower warning position dependent on a minimun fluid level in said casing; and a check mechanism comprising a vertical rod extending into the interior of said casing from the exterior thereof through a head portion of said seal cap and being movable along one side of said tubular member, said vertical rod having a stopper in engagement with a portion of said seal cap and said tubular member and said vertical rod having a lower end engageable with the upper face of said float to push down said float when the surface of fluid is maintained above said predetermined level; and resilient means for biasing said vertical rod upward to maintain engagement of said stopper against said seal cap;

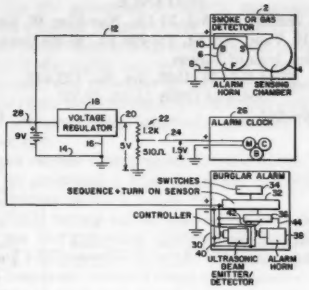
the improvement which comprises a second cap coupled over the head of said seal cap and formed at its bottom periphery with a radial recess providing a vent passage around the head portion of said seal cap, said second cap being formed at its head portion with a flexible means, the upper end portion of said vertical rod being secured thereto in an air tight manner.

4,321,591
PORTABLE, SELF-POWERED MULTIPLE WARNING DEVICE

Thomas Vieweg, 1089 N. Corona Ave., Valley Stream, N.Y. 11735

Filed Feb. 5, 1980, Ser. No. 118,764
Int. Cl.³ G08B *19/00*; G04C *23/12*
U.S. Cl. 340—521 **11 Claims**

1. Portable, self-powered multiple warning device, comprising an alarm clock, a smoke or gas detector, a common power source for powering said alarm clock and smoke or gas detector, first warning means for issuing an activation signal for said alarm clock and second warning means for issuing an activation signal for said smoke or gas detector, said warning means

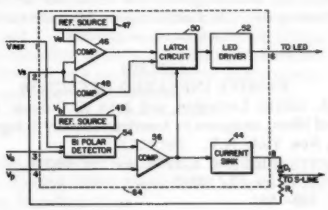


being combined into a single warning unit issuing different warnings for each warning means.

4,321,592
MULTIPLE SENSOR INTRUSION DETECTION SYSTEM

Richard E. Crandall, Portland, Oreg.; Sheldon P. Apsell, Nahant, and Aaron A. Galvin, Lexington, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,534
Int. Cl.³ G08B *25/00*
U.S. Cl. 340—541 **9 Claims**



1. An intrusion detection system comprising:

a control unit coupled to a multi-conductor cable extending along a predetermined path in a facility to be protected;

a mode selector coupled to said control unit and providing mode control signals which are at respective signal levels corresponding to selected display modes of sensor indicators for control of the operating display mode of the sensor indicators;

one or more intrusion sensors associated with the sensor indicators and connected to said cable and operative to provide an alarm signal upon intrusion detection;

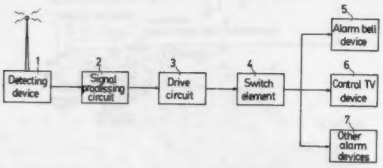
alarm means coupled to said control unit and operative to denote an alarm condition detected by one or more of said intrusion sensors;

for each of said sensors, an interface circuit coupling its sensor to said cable and operative in response to the mode control signals received on one line of said cable from said control unit to determine the display mode of the sensor indicator, and operative in response to alarm signals from said sensor to convey an alarm signal on the same line of said cable to said control unit for actuation of said alarm means irrespective of the selected display mode of the sensor indicator specified by the mode control signals.

4,321,593
TELEVISION SET WITH SUPERVISORY FUNCTIONS OF ALARMING BURGLARY AND SAFE WATCHING DISTANCE

Chi C. Ho, 2nd Fl., No. 5-3, 23 La., Nan-King W. Rd., Taipei, and Tai H. Yang, No. 51, Tai-Pin St., Si-Hu Jenn, Chiang-Hwa Hsien, both of Taiwan

Filed Feb. 21, 1980, Ser. No. 123,423
Int. Cl.[3] G08B *13/00, 21/00*
U.S. Cl. 340—541 11 Claims

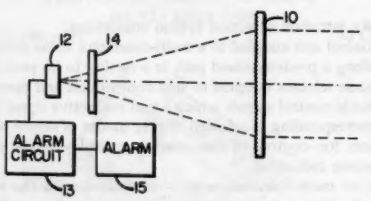


1. An apparatus comprising:
a television set, and
supervisory means attached to said television set, said supervisory means including a detecting means for detecting a moving target within a predetermined distance of the front of the television set; a signal processing circuit for analyzing and amplifying a signal from said detecting means; a drive circuit, responsive to said signal processing circuit for generating a switch driving signal; first and second switch elements responsive to said drive circuit, said first switch element being adapted to actuate an alarm and said second switch element being adapted to be coupled to said television set so as to provide an indication by either or both of the audio and video thereof, of the presence of a moving target within said predetermined distance, the indication via the television set warning a viewer to move to a safe distance from the television set.

4,321,594
PASSIVE INFRARED DETECTOR

Aaron A. Galvin, Lexington, and John K. Guscott, Lynnfield, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,399
Int. Cl.[3] G08B *13/18;* H01L *9/00*
U.S. Cl. 340—567 8 Claims

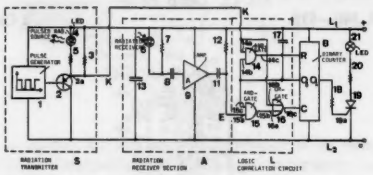


1. A passive infrared intrusion detection system comprising:
a sheet of material transmissive to infrared radiation in a predetermined infrared range and having at least one Fresnel lens formed therein, said lens being disposed to receive and to focus incident infrared radiation from a protected area, said sheet being translucent to light outside of said infrared range such that visible light is diffused by said sheet; and
a blanced detector disposed at the focus of said lens, said detector having two sensing elements electrically connected in series opposition and operative to provide an electrical output signal in response to the infrared radiation focused thereon, and substantially no output signal in response to diffused non-focused visible light transmitted by said sheet.

4,321,595
SMOKE DETECTOR

Erwin Tresch, Maennedorf, Switzerland, assignor to Cerberus AG, Maennedorf, Switzerland

Filed Dec. 19, 1979, Ser. No. 105,213
Claims priority, application Switzerland, Feb. 22, 1979, 1773/79
Int. Cl.[3] G08B *17/10*
U.S. Cl. 340—630 7 Claims

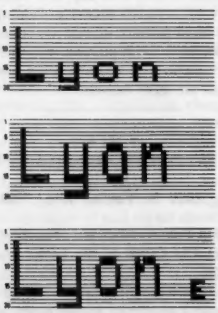


1. In a smoke detector having a radiation source operated in a pulsed mode, a radiation receiver arranged externally of a direct radiation region of the radiation source, the radiation receiver being impinged in the presence of smoke in the radiation region by scattered radiation and delivering output pulses, and an evaluation circuit capable of triggering an alarm when radiation pulses of the radiation source and output pulses of the radiation receiver are in coincidence, the improvement which comprises:
said evaluation circuit containing a counter;
said counter counting both the radiation source pulses and also the output pulses of the radiation receiver; and
said evaluation circuit comprising means for resetting said counter in the presence of an uneven counter state to null after a random radiation pulse, but upon reaching a predetermined even numbered counter state triggering a signal.

4,321,596
METHOD OF ALIGNING VIDEOTEX CHARACTERS AND DEVICE FOR CARRYING OUT SUCH A METHOD

Charles Hernandez, Villejuif, and Jean-François Marquet, Clamart, both of France, assignors to Telediffusion de France, Paris, France

Filed May 22, 1980, Ser. No. 152,389
Claims priority, application France, May 23, 1979, 79 13238
Int. Cl.[3] G09G *1/16;* H04N *5/44*
U.S. Cl. 340—724 4 Claims



1. A method of aligning characters on the screen of a televi-

sion receiver, wherein single height (1H) characters are arranged in horizontal rows each occupying ten scanning lines, wherein a downstroke of a 1H character has a vertical dimension of two lines, and wherein the vertical dimension of the characters and therefore of the rows may be doubled by repetition of the display element of a line over the following line, said method being characterized by the steps of:

ascertaining, during the scanning time of the nondisplayed first line of each row,

(1) whether or not the row is only composed of double height (2H) characters, and

(2) whether or not the row contains at least one 2H character, with downstroke, and

defining then the alignment as follows:

(a) if the row only contains 2H characters, the alignment is offset upwards by two lines with respect to the alignment of 1H characters;

(b) if the row contains both 1H and 2H characters, and contains no 2H character with downstroke, the alignment is the same as in the case of 1H characters;

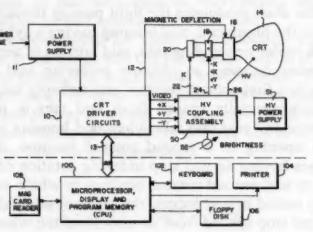
(c) if the row contains both 1H and 2H characters, and contains at least one 2H character with downstroke, the alignment of the 2H characters is offset upwards by one line with respect to the alignment of 1H characters, and the last line of the 2H character with downstroke is not repeated.

4,321,597

EXPANDED CHARACTER GENERATOR

Joel T. Martin, Melbourne, Fla., assignor to Documation Incorporated, Melbourne, Fla.

Filed Jul. 22, 1980, Ser. No. 171,172
Int. Cl.³ G09G *1/08*
U.S. Cl. 340—724 **11 Claims**



1. In a cursive writing type word processing system having a cathode ray tube display using a magnetic deflection system to produce a scanning raster and an electrostatic deflection system to deflect the electron beam for writing cursive characters on the cathode ray tube screen from a sequence of linear strokes for each character, a central control processor unit having display and program memories for producing control commands, input devices connected to the control processor unit to initiate control commands, and a read only memory having a plurality of microprograms wherein each program is representative of a single character, the improvement comprising:

digital to analog converter means coupled to the read only memory for converting sequentially generated bytes from each microprogram read out from said read only memory, in response to a command from the control processor unit, into four independent analog signals, said digital to analog converter means having output lines connected to an X+ deflection electrode, a Y+ deflection electrode, a Y− deflection electrode, and a Z electrode of the cathode ray tube, said means including

at least two X+ fixed current source means coupled to the X+ output line for generating a selectable magnitude potential having a first polarity on the X+ output line, said magnitude selected by a command from the control processor unit,

X+ variable current source means coupled to the X+ output line for generating a variable magnitude potential having a second polarity on the X+ output line, the magnitude of the variable magnitude potential being representative of the digital data in each byte which defines the magnitude and direction of the X component of each stroke of the electron beam, the fixed and variable magnitude potentials being additively combined on the X+ output line,

Y+ fixed current source means coupled to the Y+ output line for generating a fixed magnitude potential having a first polarity on the Y output line,

Y+ variable current source means coupled to the Y+ output line for generating a variable magnitude potential having a second polarity on the Y+ output line, the variable magnitude potential being representative of the digital data in each byte which defines the magnitude and direction of the Y component of each stroke of the electron beam, the fixed and variable magnitude potentials being additively combined on the Y+ output line,

Z variable current source means coupled to the Z output line for generating a potential on the Z output line having a magnitude representative of the digital data of each byte which defines the intensity of each stroke,

Y− variable voltage means coupled to the Y− output line for generating a variable magnitude potential having a selectable polarity, said potential and polarity selected by a command from the central processing unit;

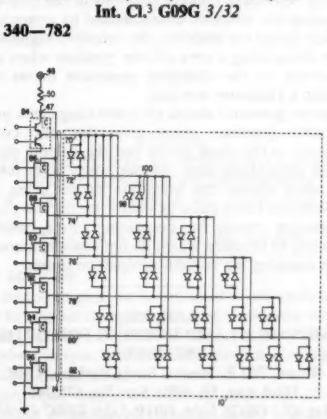
said digital to analog converter means adapted to thereby convert the sequentially generated bytes of each microprogram read out from the read only memory into four independent analog signals for controlling the position and intensity of the cathode ray tube electron beam to write a selected character on the screen of the cathode ray tube by connecting variable intensity, variable length linear strokes in patterns determined by each selected microprogram, and by biasing said Y− deflection electrode during writing of the selected character to form a superscript character, a subscript character or a normal character in accordance with a control processor unit command.

4,321,598

DOUBLE DENSITY DISPLAY DRIVE SYSTEM

Richard C. Warner, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 21, 1980, Ser. No. 170,356
Int. Cl.³ G09G *3/32*
U.S. Cl. 340—782 **5 Claims**



1. A display system comprising:

a first plurality of conductors;

a second plurality of conductors;

a plurality of pairs of oppositely poled and parallel connected display elements arranged at respective intersection points of a matrix array of said first and second pluralities of conductors;

a first voltage source at a first voltage level;

a second voltage source at a second voltage level differing from said first voltage level by a predetermined voltage difference; and

means for connecting one of said first or second voltage sources to one of said first plurality of conductors and the other of said first or second voltage sources to one of said second plurality of conductors;

whereby a selected one of the pair of display elements at the intersection point of said one of said first plurality of conductors and said one of said second plurality of conductors has said predetermined voltage difference applied thereacross with appropriate polarity to energize only said selected display element.

4,321,599

HIGH LEGIBILITY MULTI-CHARACTER DOT MATRIX DISPLAY

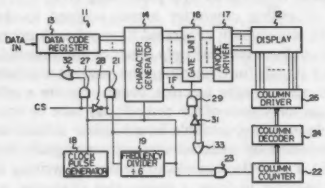
Yutaka Yoshiba, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1979, Ser. No. 99,349

Claims priority, application Japan, Dec. 20, 1978, 53/159434

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—804 **6 Claims**



1. A dot martrix display apparatus including a multi-digit dot matrix display means having a predetermined number of columns and a column enable input for each respective column, character generator means for generating and applying to the display means column of characters corresponding to input character codes and column designation means for sequentially applying column enable signals to the column enable inputs for designating respective column positions in the display means for displaying the columns, characterized by comprising:

inhibition means for inhibiting the column designation means from designating a next column position when a column generated by the character generator means does not contain a character dot; and

clock pulse generator means for generating clock pulses, the character generator means generating next columns in response to the clock pulses and the column designation means designating next column positions in response to the clock pulses, the inhibition means being disposed between the clock pulse generator means and the column designation means for preventing clock pulses corresponding to columns which do not contain character dots from reaching the column designation means.

4,321,600

REMOVABLE LAMP HOUSING FOR OPTICAL ENCODER

Anton J. Blaser, 700 E. Mason, Santa Barbara, Calif. 93103

Filed Aug. 18, 1980, Ser. No. 178,746

Int. Cl.³ G01D *5/34*; G01P *3/36*; G08C *19/36*

U.S. Cl. 340—870.29 **1 Claim**

1. An optical encoder for mounting on a motor casing and shaft for generating an output signal of frequency proportional to the revolutions per minute of the motor shaft, including in combination:

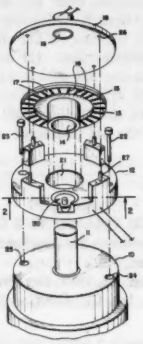
(a) a mounting member for securement to said motor casing;

(b) a disc shaped shutter having a central hub for securement to said shaft and a periphery defining alternate dark and light areas in a circumferential direction;

(c) a top cover secured to said mounting member in a position to overlie at least a portion of the periphery of said shutter such that said portion of said periphery is sandwiched between a portion of the top cover and a portion of the mounting member;

(d) a photo cell in said portion of said top cover; and

(e) a lamp housing including a reflector and lamp on said portion of the mounting member for passing light up through said portion of the periphery of said shutter to said photo cell so that rotation of the shutter with the



motor shaft modulates the light passing through the shutter to the photo cell, said housing having a cylindrical base with radially extending tabs, said portion of said mounting member defining an opening receiving said cylindrical base in a first rotated position and defining ledge portions circumferentially spaced from said tabs in positions to receive and seat said tabs when said housing is rotated in said opening to a second rotated position, one of said ledges having an end stop indexing rotation of said housing to said second rotated position in which said tabs are fully seated in said ledges, the other of said ledges having an end stop spaced from its associated tab when the housing is in said second rotated position to define a channel, whereby glue can be received in said channel to lock said housing in place in said mounting member and yet later removed if necessary to enable removal and replacement of said housing.

4,321,601

THREE DIMENSIONAL, AZIMUTH-CORRECTING MAPPING RADAR

Donald Richman, Dix Hills, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 23, 1971, Ser. No. 136,677

Int. Cl.³ G01S *13/90*

U.S. Cl. 343—5 CM **4 Claims**

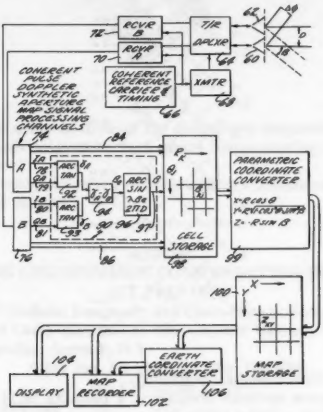
1. A signal processing radar comprising:

coherent pulsed radar transmitting and receiving means for illuminating targets with radiation at a determinable wavelength, including a plurality of radar antenna elements and a pair of receiver means, each of said receiver means receiving radar return signals from related ones of said antenna elements;

coherent pulse doppler synthetic aperture radar signal processing means responsive to said receiver means, said processing means including range gating and doppler filtering to allocate each return signal to a corresponding

range/doppler cell, said processing means providing, for each range/doppler cell, a related set of processed signals, the relative information content of which is dependent upon the relative phase angle of arrival of the respective return signals at said radar antenna elements from which the processed signals have been derived;

means responsive to said processed signals from said processing means for generating a signal manifestation of the depression angle at which the return signals related to said processed signals were received by said antenna elements



as a function of the difference in said angle of arrival between said return signals relating to a given range/doppler cell, of said determinable wavelength, and of the parameters of said antenna elements; and

means for generating, for each range/doppler cell, in response to the range and doppler identification of that cell and the depression angle signal manifestation relating to that cell, a pair of signal manifestations identifying orthogonal coordinates in a map of a corresponding map point location relating to said range doppler cell in accordance with the following relationships,

$$Y = R\sqrt{1 - \cos^2\theta - \sin^2\beta}$$

where R equals the slant range of the range/doppler cell, θ equals the cone angle of the doppler frequency of the range/doppler cell, and β equals the depression angle to the target for that range/doppler cell.

4,321,602

FREQUENCY-TRACKING FILTER, AS FOR USE IN FM-CW RADAR

Ronald W. Kipp, Croydon, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,346
Int. Cl.³ G01S 13/32
U.S. Cl. 343—14 **3 Claims**

1. A frequency-tracking filter comprising:

means responsive to a signal the frequency of which is to be tracked for symmetrically amplitude-limiting said signal about an average-level axis;

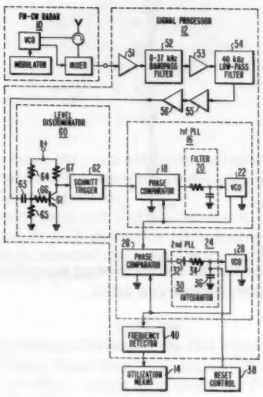
a level discriminator coupled to said limiting means to provide discriminator output signals only if said signals depart from said average-level axis by more than a predetermined threshold value;

a controlled oscillator generating output signal at a frequency determined by a control signal;

means coupled to said discriminator and said oscillator for comparing the phase of said oscillator output signal and the said discriminator output signal to provide a phase-error signal indicative of their phase of difference; and

means responsive to only those components of said phase-error signal below a predetermined cut-off frequency for providing said control signal to said oscillator.

2. Apparatus for measuring frequency comprising, in combination, a frequency-tracking filter as set forth in claim **1**, and a frequency detector coupled to said oscillator to receive output signals therefrom.



3. In combination with apparatus for measuring frequency as set forth in claim **2**, a frequency modulated continuous-wave radar including:

means for transmitting a frequency-modulated carrier wave;

means for receiving its reflection from a target; and

means for mixing said frequency-modulated wave and its reflection to provide a difference signal indicative of the range of said target; and

means for applying said difference signal to said means for symmetrically amplitude limiting, as said signal the frequency of which is to be tracked.

4,321,603

ATTACHMENT FOR ANTENNAS TO IMPROVE RECEPTION AND TRANSMISSION

George P. Wilson, 240 Andover St., North Andover, Mass. 01845

Filed Jan. 9, 1980, Ser. No. 110,644
Int. Cl.³ H01Q 1/32
U.S. Cl. 343—750 **10 Claims**

1. A device adapted to be attached to an omni-directional antenna having an elongated conductive element comprising:

an inner open-wound coil having a majority of coil turns disposed in spaced relationship about said elongated conductive element, and

an outer open-wound coil having aminority of coil turns disposed in spaced relationship about, said inner open-wound coil,

said inner open-wound coil and said outer open-wound coil

being electrically isolated from each other and from said elongated conductive element,

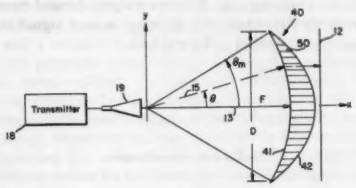
said outer open-wound coil turns being wound at an angle to said inner open-wound coil turns.

4,321,604

BROADBAND GROUP DELAY WAVEGUIDE LENS

James S. Ajioka, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 842,847, Oct. 17, 1977. This application Feb. 29, 1980, Ser. No. 126,075
Int. Cl.³ H01Q *15/06*
U.S. Cl. 343—753 10 Claims



1. A broad bandwidth waveguide lens for processing electromagnetic wave energy emanating from a focal point to provide a desired phase distribution at an aperture plane comprising:

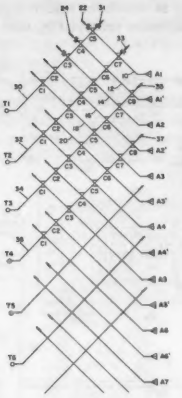
an array of adjacent hollow metallic waveguide elements having parallel longitudinal axes disposed perpendicular to said aperture plane with one of said axes passing through said focal point, each of said waveguide elements having an input port facing said focal point and an output port facing said aperture plane, the respective lengths of said waveguide elements decreasing as a function of transverse distance from said one axis such that the same time delay is provided for electromagnetic wave energy traveling from said focal point to said aperture plane via each of said waveguide elements, and half wave plate phase shifting means disposed in each of said waveguide elements for providing a predetermined phase shift for electromagnetic wave energy propagating through the said waveguide element to provide said desired phase distribution.

4,321,605

ARRAY ANTENNA SYSTEM

Alfred R. Lopez, Commack, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jan. 29, 1980, Ser. No. 116,735
Int. Cl.³ H01Q *21/08, 3/30*
U.S. Cl. 343—844 10 Claims



1. An array antenna, comprising

an antenna aperture comprising a plurality of N antenna element modules where N is a positive integer, each module comprising A antenna element groups where A is an integer greater than 1, each antenna element group comprising one or more antenna elements, said element modules and element groups being arranged along a predetermined path;

a plurality of AN first transmission lines, one associated with each of said antenna element groups, for supplying wave energy signals to the elements of said element groups;

a plurality of N second transmission lines, one associated with each of said antenna element modules, each of said second transmission lines having an input terminal and each of said second transmission lines intersecting a selected number less than AN of said first transmission lines for supplying wave energy signals to said associated module and modules adjacent to said associated module;

a plurality of N sets of directional couplers, each set having said selected number of couplers and, corresponding couplers of said N sets being substantially identical, each set for coupling one of said N second transmission lines to said intersected first transmission lines, and each of said directional couplers having a selected coupling amplitude and coupling phase to cause signals supplied to any of said input terminals to be coupled primarily to the element groups of an element module corresponding to said input terminal and to be coupled with selected relative amplitude and phase to selected elements in other element groups of said array.

4,321,606

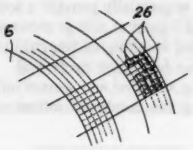
MAGNETIC TYPE PRINTING PROCESS AND MULTICOPY MAGNETIC PRINTING MACHINE

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Oct. 29, 1979, Ser. No. 89,040
Claims priority, application France, Feb. 23, 1979, 79 04616
Int. Cl.³ G11B *11/00*
U.S. Cl. 346—74.1 13 Claims

1. A process of magnetic printing wherein a plurality of elementary magnetized areas in matrix form forming printing

characters are recorded on a magnetizable carrier, comprises depositing on the carrier a developer product containing magnetic particles which are attracted by and fixed on the magnetized areas and thus reveal the characters recorded, said magnetic particles being formed by grains of which the dimensions



are of the order of those of the elementary magnetized areas, the symbols covered by such grains thus appearing raised on the carrier;

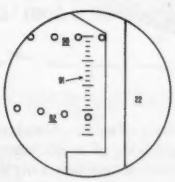
and pressing the raised symbols against a document which is to be printed.

4,321,607

SCALING AERODYNAMIC COMPENSATION IN AN INK JET PRINTER

Harry P. Heibein, Longmont, and Chein-Hwa S. Tsao, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,339
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **20 Claims**



1. In an ink jet printing process, using electromagnetic fields to control the flight path of the drop and having apparatus for correcting the flight path for drop interactive aerodynamic effects, a method for correcting the flight path of the ink drops for environmental aerodynamic effects, said method comprising the steps of:

setting the electromagnetic fields to maintain a predetermined separation between the flight path of the print drops and the flight path of the gutter drops;

printing a predetermined pattern corrected for drop interactive effects with the ink jet printer;

observing the alignment of drops printed in the predetermined pattern, errors in said alignment being indicative of environmental effects; and

adjusting the electromagnetic fields to change the flight path of the print drops to correct for errors in the print pattern due to the environment of the ink drops.

4,321,608

DEFLECTION PLATE ARRAY

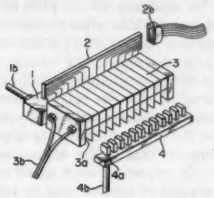
Sadao Kakeno, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,658
Claims priority, application Japan, Sep. 3, 1979, 54-112585
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **5 Claims**

1. In an electrostatic deflection type ink-jet printer, a deflection plate array characterized in that

a plurality of deflection plates each consisting of an insulating substrate and thin-film electrodes formed on the major surfaces thereof, respectively, and a plurality of insulating spacers are interleaved;

two electrode rods are extended through the array of interleaved deflection plates and spacers in such a way that one of said two electrode rods is electrically connected to one of the thin-film electrodes on one major surface of each deflection plate while the other electrode is electrically connected to the other thin-film electrode on the other major surface of each deflection plate; and



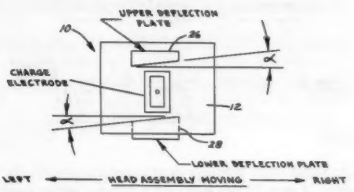
said deflection plates and said spacers are so interleaved that the portion of each deflection plate bearing said thin-film electrodes is extended downward beyond the bottom of the corresponding spacer.

4,321,609

BI-DIRECTIONAL INK JET PRINTER

Thomas D. Fidler, Lake Orion, and Anthony P. Sapino, Rochester, both of Mich., assignors to Computer Peripherals, Inc., Minneapolis, Minn.

Filed Nov. 24, 1980, Ser. No. 209,433
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **2 Claims**



1. An ink jet printer in which printing can occur in both directions of ink jet head travel comprising:

means for providing excited ink droplets, said means adapted to travel with respect to the printing medium,

means for charging the ink droplets with an electric charge,

means for controlling said means for charging ink droplets to determine an ascending or descending scan pattern,

deflection plate means having at least a first deflection plate and a second deflection plate disposed at an angle with respect to the direction of travel of said means for providing the excited ink particles, where the angle of tilt of the deflection plates from the horizontal is α and is determined by the formula:

$$\alpha = \tan^{-1} 2\,(N - 1 + G)\,\frac{(V)}{(f)}\;\frac{(1)}{(N-1)\,R}$$

where

α is in degrees,

N is the number of drops associated with the maximum vertical segment in the character set,

f is the piezoelectric drive frequency (HZ),

R is the vertical spacing between drops on the paper (inches),

V is the velocity of the carrier (ips), and

where

G is the number of guard drops inserted in the segment,

means for providing a deflection voltage to said first and second deflection plates,

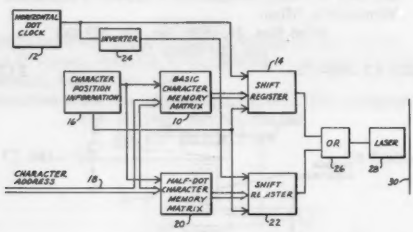
control means responsive to the relative direction of travel of the printing medium with repect to the source of ink jet droplets,

wherein said control means causes said means for controlling said means for charging ink droplets to deposit ink droplets in a first scan pattern with respect to the first direction of travel and in a second scan pattern with respect to the other direction of travel of the source of ink jet droplets with respect to the medium on which ink jet particles are to be deposited so that the relative motion of the source and the medium is compensated for by the tilted deflection plates so that the ink jet droplets are deposited in a fashion corresponding to that if the source and medium were stationary with respect to each other and in which both relative directions of motion may be utilized for depositing ink jet droplets as a result of the use of the two scan patterns of ink jet droplets.

4,321,610
DOT MATRIX PRINTER WITH HALF SPACE DOT CAPABILITY

Donn F. Moore, Utica, and Michael A. Folkerts, Rochester, both of Mich., assignors to Computer Peripherals, Inc., Minneapolis, Minn.

Filed May 5, 1980, Ser. No. 146,881
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—108 **2 Claims**



1. Apparatus for printing characters by selectively printing a plurality of dots in pre-selected positions along each of a plurality of rows comprising:

first memory matrix means for storing first data related to the characters to be printed, such first data comprising, for each character, information concerning the location of each dot to be printed at each pre-selected first position along each of said rows in a first matrix to form a basic pattern for the respective character;

first shift register means for storing all information of the first data related to a row of dots for at least one character;

second memory matrix means for storing second data related to the characters to be printed, such second data comprising, for each character, information concerning the location of each dot to be printed at each pre-selected second position along each of said rows in a second matrix to form an enhancement pattern for the respective character, the arrangement of said enhancement pattern being such as to provide dots along said rows at pre-selected second positions between pre-selected first positions of said basic pattern along the edges of the respective characters which are skewed from said rows at an angle other than 90° when said second matrix is superimposed over said first matrix in an offset position along said rows by an amount less than the distance between adjacent dots of said basic pattern along said rows;

second shift register means for storing all information of said second data related to at least said row of dots for said one character;

clock means for supplying a first clock signal to said first shift register means for continuously sequencing the information of the first data stored therein to sequentially provide a first information signal to a first output at a predetermined carrier frequency;

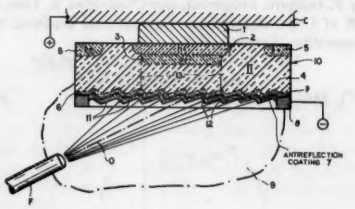
inverter means connected to said clock means for supplying a second clock signal to said second shift register means for continuously sequencing the information of second data stored therein to sequentially provide a second information signal to a second output at said predetermined carrier frequency, said second clock signal being shifted from said first clock signal by one-half clock cycle; and

means for combining said first and second information signals and for supplying the combined information signals to a print means.

4,321,611
AVALANCHE PHOTODETECTOR FOR FIBER-OPTICAL SYSTEM AND METHOD OF MAKING SAME

Mario Conti, Milan, Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 26, 1979, Ser. No. 24,076
Claims priority, application Italy, Apr. 4, 1978, 67838 A/78
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **7 Claims**



1. A high-sensitivity avalanche photodetector comprising a generally plate-shaped body of semiconductor material with a high-resistivity intermediate portion, a highly doped first layer of one conductivity type adjoining said intermediate portion while being overlain by a highly doped second layer of the opposite conductivity type forming therewith a p/n junction on one major surface of said body, a third layer of said one conductivity type adjoining said intermediate portion on the other major surface of said body, and a pair of electrodes respectively in contact with said second and third layers for applying a reverse-biasing potential to said p/n junction across said body;

said other major surface provided with said third layer being serrated with major sawtooth flanks generally parallel and minor sawtooth flanks generally perpendicular to said first and second layers.

4,321,612
SCHOTTKY BARRIER CONTACT TO COMPOUND SEMICONDUCTOR WITH THREE LAYER REFRACTORY METALIZATION AND HIGH PHOSPHOROUS CONTENT GLASS PASSIVATION

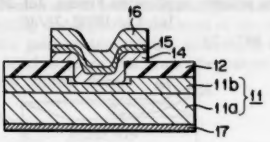
Eiji Murata, Fuchu; Hideaki Izumi, Yokohama; Atuko Sugawara, Kawasaki, and Susumu Okano, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 2, 1980, Ser. No. 109,080
Claims priority, application Japan, Jan. 24, 1979, 54-6116
Int. Cl.³ H01L *29/48*
U.S. Cl. 357—15 **7 Claims**

1. A Schottky barrier type compound semi-conductor device comprising:

an N type compound semi-conductor substrate;

an insulation layer which is mounted on the substrate and includes a first layer of phosphosilicate glass directly contacting said substrate and containing phosphorus at a concentration of $1\times10^{21}/cm^3$ or more, and is provided with a penetrating hole through which part of the substrate is exposed; and a metal layer comprising a first layer of niobium, tantalum, vanadium, or hafnium so formed as to constitute a Schottky barrier with the substrate, a second layer of molybdenum or tungstun mounted on said first layer and a third layer of gold, silver or platinum deposited on said second layer.



4,321,613

FIELD EFFECT DEVICES AND THEIR FABRICATION

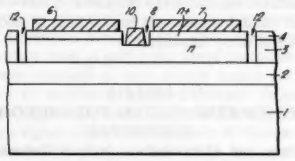
Brian T. Hughes, Sandy; John C. Vokes, Harpenden, and David R. Wight, Hitchin, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 31, 1979, Ser. No. 43,977

Claims priority, application United Kingdom, May 31, 1978, 25554/78

Int. Cl.³ H01L *21/20, 21/302, 29/80*

U.S. Cl. 357—22 **27 Claims**



1. A method of fabricating a field effect transistor comprising the steps of forming an active layer of semiconductor material over a surface of a first substrate of semiconductor material, forming source, drain and gate electrodes over the surface of the active layer, applying a second substrate of insulating material over the surface of the structure comprising the first substrate and active layer on which the electrodes are formed, and removing the first substrate, said method further including the steps of forming a buffer layer of high quality semiconductor material on the surface of the first substrate prior to formation of the active layer, said buffer layer being thinner than said first substrate, and removing said buffer layer following removal of the first substrate.

4,321,614

RADIANT ENERGY SENSOR WITH BLOOMING CONTROL

Nathan Bluzer, Silver Spring; Donald R. Lampe, Ellicott City, and Francis J. Kub, Pasadena, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,530

Int. Cl.³ H01L *27/14, 29/78*

U.S. Cl. 357—30 **21 Claims**

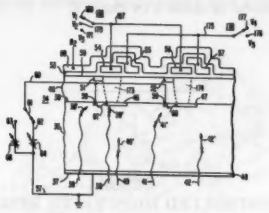
1. A sensor for convering radiant energy into electrical signals comprising:

a substrate having a first and second surface and including means for generating charge in response to the absorption of radiant energy,

a layer of semiconductor material having a first dopant deposited over said second surface of said substrate to form a third surface above said second surface,

a first and second electrode formed in said second surface,

a third electrode formed in said first surface,



means for coupling a first voltage across said first and third electrodes to attract charge to said first electrode,

means for coupling a bias voltage supply across said second and third electrodes to attract charge to said second electrode to remove charge from said substrate and said first electrode, and

means for providing a signal indicative of the charge on said first electrode.

4,321,615

MANUFACTURE OF AN INFRA-RED DETECTOR ELEMENT, AND DETECTION ELEMENTS SO MANUFACTURED

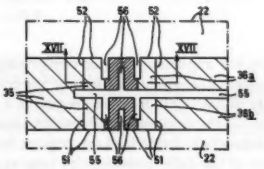
Maurice V. Blackman, and Michael D. Jenner, both of Southampton, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 59,875, Jul. 23, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,524

Claims priority, application United Kingdom, Jul. 31, 1978, 31749/78

Int. Cl.³ H01L *31/02;* **C23C** *15/00;* **H01L** *31/18*

U.S. Cl. 357—30 **75 Claims**



1. A method of manufacturing a detector element for infra-red radiation, which element comprises infra-red sensitive material having an active area and two parallel electrodes each disposed on a contact area of the infra-red sensitive material so that the active area lies between the electrodes, comprising the steps of:

(a) securing a body of infra-red sensitive material to a substrate;

(b) thereafter providing a masking layer on the body, the masking layer having elongate windows between areas on the body where the two contact areas are to be or are formed, the elongate windows exposing stripe-shaped parts of the body which extend at least transverse to the direction between the two contact areas; and

(c) ion-etching the material through the elongate windows in the masking layer, over the whole thickness of the body, to form substantially parallel slots in the active area which

extend from opposite side-walls of the detector element across part of the width of the active area to define a meandering current path in the active area between the two contact areas, which current path extends through the infra-red sensitive material remaining in said active area and is longer than the distance along a straight line between the two contact areas.

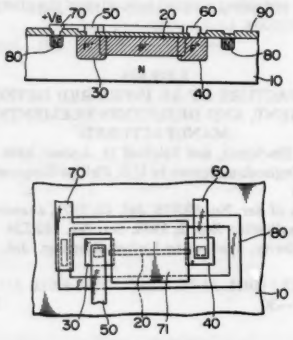
59. An infra-red detector element manufactured by the method claimed in claim 1 or claim 2.

4,321,616

FIELD CONTROLLED HIGH VALUE RESISTOR WITH GUARD BAND

Tomokazu Bise, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,408
Claims priority, application Japan, Mar. 16, 1979, 54-29856
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—51 **3 Claims**



1. A stable ion implanted resistor comprising:

a high resistance region having ions of one conductivity type impurity diffused into a surface region of a semiconductor substrate of the opposite conductivity type;

first and second electrode lead out regions having ions of an impurity of the same conductivity type as said high resistance region diffused into portions of said surface at both ends of said high resistance region;

a channel stop region having the same conductivity type as said semiconductor substrate, said channel stop region having ions of an impurity diffused into said surface of the semiconductor substrate and surrounding said high resistance region and said first and second electrode lead out regions and spaced from said high resistance region and said lead out regions;

an electric insulating film on said surface of said semiconductor substrate; and

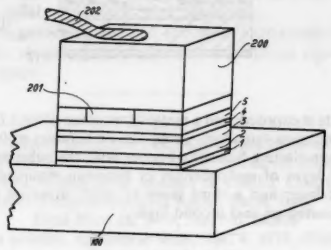
an electroconductive film extending from said high resistance region to said channel stop region on both sides of said high resistance region and covering said insulating film, and connected to said channel stop region and being for applying a reverse bias potential through said channel stop region to the PN junction formed between said semiconductor substrate and said high resistance region.

4,321,617

SYSTEM FOR SOLDERING A SEMICONDUCTOR LASER TO A METAL BASE

Eugene Duda; Alain Maumy, and Claude Tondu, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 19, 1979, Ser. No. 58,925
Claims priority, application France, Jul. 25, 1978, 78 21969
Int. Cl.³ H01L *21/60*
U.S. Cl. 357—71 **7 Claims**



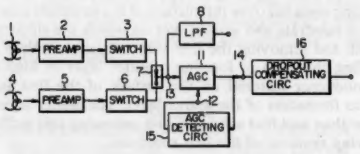
1. A semiconductor device comprising: a semiconductor having a bottom, a metallic substrate for supporting said semiconductor body and bonding means for soldering said bottom onto a face of said metallic substrate; said bonding means comprising two barrier layers of a first metal respectively deposited onto said bottom and said face, two wetting layers of a second metal respectively deposited onto said barrier layers and a further layer of soft solder material made of indium joining together said two wetting layers at least a portion of said wetting layers forming an alloy with a small portion of said solder material; said barrier layers preventing said soft solder material from alloying with said semiconductor body and said metallic substrate; the thickness of said wetting layers being small enough to prevent impairment of said soft solder material due to alloy formation.

4,321,618

REPRODUCING SYSTEM FOR VIDEO TAPE RECORDERS

Koichi Hirose, and Akira Shibata, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,625
Claims priority, application Japan, Jul. 19, 1978, 53-87187
Int. Cl.³ H04N *5/76, 5/78*
U.S. Cl. 358—8 **4 Claims**



1. A reproducing system for video tape recorders comprising:

amplifier means for amplifying a plurality of signals picked up by a plurality of video heads, respectively, each signal containing a luminance portion and a chrominance portion;

switching means connected to said amplifier means for alternately conducting said plurality of signals directly to a coupling line on which is formed a continuous signal from said plurality of signals on a common signal path;

an automatic gain control circuit having its input connected

to said coupling line for reception of the luminance portion of said continuous signal;

a color signal extracting circuit connected to said coupling line for extracting said chrominance portion from said continuous signal prior to application of said luminance portion to said automatic gain control circuit; and

circuit means connected to said automatic gain control circuit for detecting and adjusting the level of the output of said automatic gain control circuit, whereby a constant FM output level is taken out from the output of said automatic gain control circuit.

4,321,619

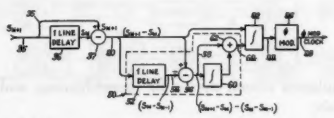
SECOND ORDER VELOCITY ERROR CORRECTION FOR TIME BASE CORRECTORS

Bantval Y. Kamath, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 24, 1979, Ser. No. 87,897

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—8 **17 Claims**



1. Apparatus for generating second order error correction signals for compensating time base errors in a color video information signal including horizontal line and color burst time base synchronizing components, comprising:

first means for receiving a representation of the phase of the color burst component of said video information signal from each of at least three horizontal lines;

second means coupled to said first means for measuring and generating a phase difference signal representative of a phase difference between the phase representations of consecutive ones of said color burst components;

third means coupled to said second means for measuring changes in measured phase difference represented by successive phase difference signals and responsively generating a signal indicative of the rate of change of phase of the color burst component; and

fourth means coupled to said second and third means for generating an error correcting signal that is proportional to said measured phase difference and said rate of change of the phase of the color burst component.

4,321,620

COLOR SCANNER FOR PLATE MAKING

Riyo Shimooka; Hitomi Atoji; Takeshi Yamazaki, all of Kyoto, and Masuo Kunisawa, Uji, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 27, 1977, Ser. No. 864,758

Claims priority, application Japan, Dec. 28, 1976, 51-159899

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **2 Claims**

1. A color scanner of substantially rigid construction for plate making, comprising:

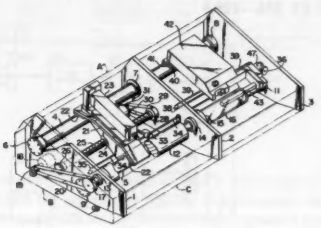
an original picture scanning means which comprises an original picture cylinder for an original picture and a pick-up head for photoelectrically scanning the original picture to obtain image signals, which is movable in the axial direction of the original picture cylinder;

a reproduction image recording means which comprises a recording cylinder carrying a photosensitive material and an exposure head for recording a reproduction image by using the image signals, which is movable in the axial direction of the recording cylinder;

a plurality of matched frame plates having similar shapes, which are arranged in parallel with one another, each frame plate including openings in the same relative position;

a pair of parallel guide members are fitted through sets of said openings in at least three of said frame plates and support the heads;

a common shaft for supporting coaxially the cylinders, is fitted in bearings mounted to a set of said openings in at least two of the frame plates and is parallel to the pair of parallel guide members; and a single feed screw mounted



generally between said guide members and extending through another set of said openings in at least two adjacent frame plates and said single feed screw moving all of said heads synchronously in the axial direction of the cylinders, which is parallel to said pair of parallel guide members; whereby said guide members, said common shaft and said cylinders, and said feed screw are all positioned substantially in parallel with respect to each other, thereby minimizing reproduction errors in a reproduction picture.

4,321,621

HIGH DENSITY RECORDING SYSTEM USING SIDE-BY-SIDE INFORMATION AND SERVO TRACKS

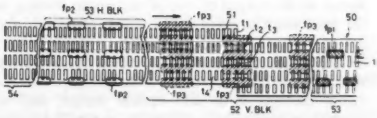
Hisao Kinjo, and Keiji Ozawa, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Division of Ser. No. 785,095, Apr. 6, 1977. This application Oct. 25, 1979, Ser. No. 88,168

Claims priority, application Japan, Apr. 8, 1976, 51-38809; Oct. 26, 1976, 51-127767

Int. Cl.³ H04N *5/76*; G11B *21/06*

U.S. Cl. 358—128.6 **7 Claims**



1. A recording disc having a plurality of track turns recorded thereon, information signal track turn means having a video signal recorded thereon, a track pitch of the information signal track turn means being substantially equal to a width of said information signal track turn means; and reference signal track turn means having reference signals recorded thereon; each of said reference signal track turn means being formed on a intermediate part of said recording disc located between center lines of adjacent information signal track turn means, each of the reference signal track turn means having a width narrower than the width of the information signal track turn means and being recorded so as to overlap on the adjacent information signal track turn means, the reference signals being a plurality of different kinds of signals with each individual reference signal being recorded along a reference signal track turn means, two of said different kinds of reference signals being alternately recorded on every other reference signal track turn means on the recording disc at positions correspond-

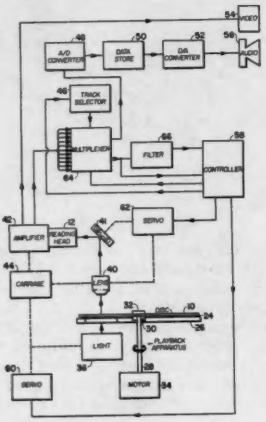
ing to the horizontal blanking periods of the video signal recorded on the information signal track turn means.

4,321,622

VIDEO TRACK TRANSFER SYSTEM AND METHOD

Jonathan A. Jerome, Palo Alto; Frank D. Neu, Castro Valley, and Geoffrey T. Faraghan, Oakland, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 26, 1979, Ser. No. 97,328
Int. Cl.³ H04N 5/76
U.S. Cl. 358—128.5 **4 Claims**



1. In a system for optically reproducing video signals and related audio signals recorded on a rotary disc in the form of successive sets of concentric tracks, each such track set being composed of a video track followed by at least one audio track and wherein a movable array of video and audio sensing elements is adapted to be positioned to receive simultaneously said respective video and audio signals, the means for correctly aligning the sensing elements of said array and the respective tracks within each of said sets comprising:

a. controller means for moving the optical image of said tracks in a radial direction relative to said array, and

b. scanning means responsive to the presence of a video signal on the output of one of said audio sensing elements for generating an error signal whose amplitude and polarity correspond to the magnitude and direction of said misalignment, said error signal being operatively coupled to said controller means so as to produce the necessary radial movement of said optical image, said scanning means comprising in combination means for scanning the output of each of said audio sensing elements and frequency discrimination means operatively interconnected between the output of said scanning means and said controller means, said discriminator means being adapted to pass only video frequencies.

4,321,623

AUXILIARY TELEVISION SIGNAL SYSTEM

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corp. of America, Franklin Park, Ill.

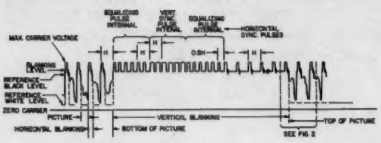
Filed Apr. 14, 1980, Ser. No. 139,848
Int. Cl.³ H04N 7/04
U.S. Cl. 358—144 **9 Claims**

1. An auxiliary signal system for television receivers responsive to composite color television signals and in which an auxiliary signal in the form of a modulated multiple-cycle signal burst at the frequency at the standard color subcarrier signal of the composite color television signal is transmitted on the front porch of the composite television signal, said system including in combination:

supplying means for supplying a composite television signal to signal processing circuits of a television receiver;

sample circuit means;

sweep circuit means in the television receiver producing horizontal fly-back pulses therefrom and coupled with said sample circuit means to operate said sample circuit means in response to the application of said horizontal fly-back pulses thereto;



demodulation circuit means for demodulating said auxiliary signals;

analog transmission gate circuit means coupled between said supplying means and the input of said demodulation circuit means, said gate circuit means further coupled with said sample circuit means and operated in response thereto to supply only said modulated auxiliary signal to said demodulation means; and

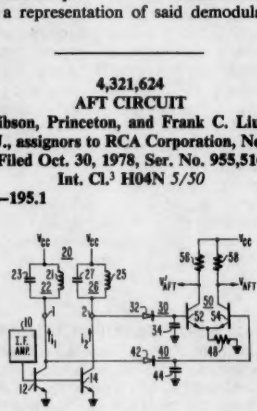
utilization means coupled with said demodulation means for producing a representation of said demodulated auxiliary signals.

4,321,624

AFT CIRCUIT

Walter G. Gibson, Princeton, and Frank C. Liu, Piscataway, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,516
Int. Cl.³ H04N 5/50
U.S. Cl. 358—195.1 **10 Claims**



1. Frequency discriminating apparatus for detecting the frequency deviation of a carrier signal from a predetermined reference frequency, said carrier signal having a higher amplitude for frequency deviation of a first sense from said reference frequency than for frequency deviation of a second sense which is opposite said first sense, comprising:

a first tuned circuit having a first resonant frequency which differs from said predetermined reference frequency in said first sense, and exhibiting a given impedance at said first resonant frequency;

a second tuned circuit having a second resonant frequency which differs from said predetermined reference frequency in said second sense and exhibiting an impedance at said second resonant frequency which is greater than said given impedance;

means for applying said carrier signal to said first and second tuned circuits; and

first and second detector networks coupled to said respective tuned circuits for detecting voltage signals developed by said tuned circuits in response to said carrier signal.

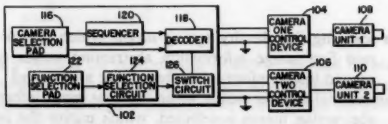
4,321,625
CONTROL SYSTEM FOR PLURALITY OF VIDEO CAMERAS

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 60,463, Jul. 25, 1979, which is a continuation-in-part of Ser. No. 22,505, Mar. 21, 1979, Pat. No. 4,225,886, which is a continuation-in-part of Ser. No. 851,812, Nov. 16, 1977, Pat. No. 4,152,696. This application Jun. 13, 1980, Ser. No. 159,172

Int. Cl.³ H04N *5/24*

U.S. Cl. 358—210 **10 Claims**



1. A video camera system comprising:

a plurality of movable video cameras;

controlled means coupled to each of said video cameras for causing movement of the associated said video camera;

input control means including camera selection means for enabling selection of one of said video cameras for control by said input control means and input voltage generating means for generating a plurality of different voltage level input signals, with each of such input voltage signals serving to enable a separate control function of said controlled means for the selected said video camera;

a plurality of video camera control mechanisms, each being associated with one of said video cameras, each of said video camera control mechanisms including: a plurality of first switching means coupled to receive the input voltage signals from said voltage generating means, each of said first switching means being activated when the input voltage signal is above a corresponding predetermined level with the predetermined level for each of said first switching means being different and blocking the input of others of said first switching means that are normally actuated at lower voltage levels so that only one of said first switching means provides an output in response to a single input voltage signal; and a plurality of first output means for selectively controlling different functions of said controlled means for said video camera being controlled, each of said first output means being coupled to the output of one of said first switching means and causing one of the functions of said video camera when receiving a first switching signal from the corresponding said first switching means.

4,321,626
FACSIMILE APPARATUS

Yoshinori Wada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 140,375

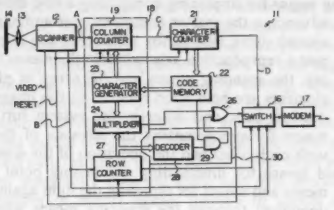
Claims priority, application Japan, Apr. 14, 1979, 54-44861

Int. Cl.³ H04M *1/00*

U.S. Cl. 358—263 **7 Claims**

1. A facsimile apparatus including memory means for storing identification character codes and character generator means for generating character video signals corresponding to the codes, characterized in that each character code comprises information indicating whether a character corresponding to the code is to be underlined, the apparatus further comprising:

line generator means for sensing said information and generating underline video signals corresponding to positions under the characters to be underlined;



facsimile means for producing facsimile video signals; and

switch means for selectively passing therethrough the character video signals and underline video signals in combination or the facsimile video signals.

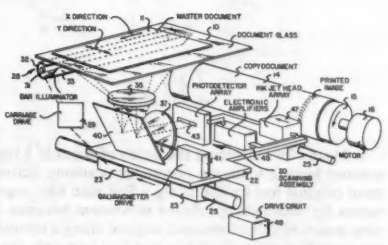
4,321,627
OPTICAL SCANNER FOR INK JET PRINTER

Ross B. Hooker, III, Boulder, Colo., and Wilson M. Routt, Jr., Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,284

Int. Cl.³ H04N *1/10, 1/42*

U.S. Cl. 358—286 **1 Claim**



1. A document reproduction system comprising:

master document support means;

means for illuminating a band of at least a selected width along a first axis extending across the master document;

an array of photosensitive elements;

scanning means for scanning the illuminated band along the first axis throughout a line orthogonal thereto and extending across the width thereof, said scanning means directing each of a number of scanning line images onto the different ones of the array of photosensitive elements;

copy document support means for supporting a copy document;

means for scanning along a band of a display area in synchronism with the operation of the scanning means relative to the master document and comprising an array of ink jet printer elements disposed adjacent the copy document for scanning the copy document in parallel along an axis corresponding to the first axis on the master document;

circuit means coupled to the means for scanning a display area to generate line images along the band in response to energization of the individual photosensitive elements and comprising means for energizing the individual ink jet printer elements; and

means for displacing the means for illuminating, the array of photosensitive elements and the scanning means in a direc-

tion orthogonal to the first axis relative to the master document and concurrently displacing the means for scanning relative to the display area in a direction orthogonal to the first axis whereby the entire master document is scanned and an image corresponding to the master document is concurrently generated at the display area;

the means for displacing comprising a first drive system for advancing the master document past an image axis and a second drive system for advancing the copy document past a reproduction axis, wherein the means for illuminating, the scanning means and the array of photosensitive elements are held fixed relative to the image and reproduction axes, and wherein the system further includes means for synchronizing the advance of the documents with each other and the operation of the scanning means;

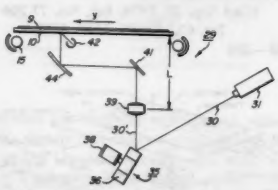
said means for illuminating comprising point source light means and means for directing the light against the master document through the scanning means whereby movement of the scanning means causes the light from the point source light means to sweep the master document along the band and be returned through the scanning means.

4,321,628

SCANNING APPARATUS

Peter A. Crean, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1980, Ser. No. 136,634
Int. Cl.³ H04N *1/10*
U.S. Cl. 358—293 **8 Claims**



1. Means for enhancing the depth of focus in a raster image scanner having scanning means for scanning across a document original line by line along a first scan axis, together with means for establishing relative movement between said scanning means and the document original along a second scan axis substantially perpendicular to said first scan axis, the combination of:

at least one projection lens for focusing imaging rays on said document original; and

optical means for bending said imaging rays so that said imaging rays are substantially normal to both said first and second scan axes whereby to increase the depth of focus of said scanning means,

said optical means being disposed between said projection lens and said document original.

4,321,629

IMAGE INFORMATION READING SYSTEM

Fumihoro Ogasawara, Kawasaki, Japan, assignor to Ricoh Company, Limited, Tokyo, Japan

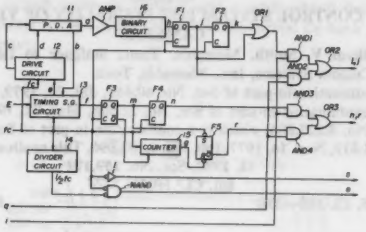
Filed May 22, 1980, Ser. No. 152,319
Claims priority, application Japan, Jun. 5, 1979, 54-69402
Int. Cl.³ H04N *1/02, 1/40*
U.S. Cl. 358—294 **6 Claims**

1. An image information reading system capable of taking out the image information corresponding to a selected scanning line density comprising:

a reading head for reading image information comprising N light receiving elements arranged substantially in the subscanning direction;

a first image information abstracting means for abstracting image information for the N/n consecutive bits from predetermined bits in N bits of image information read by said reading head where n is a integer of 2 or more;

a second image information abstracting means for deriving N/n bits of image information by combining every n consecutive bits of information for N bits read by said reading head;



a scanning line density setting means which selects either said first image information abstracting means or said second image information abstracting means; and

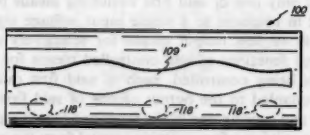
an original transfer means, when said first image information abstracting means is selected, which moves the original document relative to said reading head by 1/n of the subscanning movement distance in the case of the selection of said second image information abstracting means.

4,321,630

LINEAR INTEGRATING CAVITY LIGHT COLLECTOR

Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1980, Ser. No. 183,134
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—294 **17 Claims**



1. In a flying spot scanning system adapted to raster scan an information bearing surface, a light collector for collecting light reflected from said scanned surface, said light collector comprising:

a generally cylindrical, hollow integrating cavity having at least one longitudinally extending slit therein, said cavity disposed relative to said scanned surface so that light reflected from said scanned surface enters said cavity through said slit,

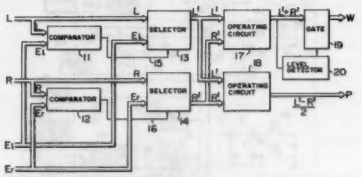
at least one photodetector element placed within said cavity to produce a signal level representative of the scanned information; and

apodizing means to improve the uniformity of said signal level.

4,321,631
CONTROL METHOD AND DEVICE FOR REPRODUCING A HALFTONE DOT CUT AWAY ALONG A PICTURE OUTLINE

Isao Saito, Shiga; Makoto Hirosawa, and Seiya Sakamoto, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 15, 1980, Ser. No. 169,265
Claims priority, application Japan, Jul. 26, 1979, 54-94275
Int. Cl.[3] H04N *1/40*
U.S. Cl. 358—298 **5 Claims**



1. In a method for reproducing a halftone picture by scanning, wherein a recording light beam to be projected on a photosensitive material is suitably controlled in the horizontal and vertical directions by means of picture signals obtained from the scanning of an original picture and wherein said signals are output in synchronism with scanning when a reproduction picture is recorded, a control method for reproducing a halftone dot cut away along an outline of the picture, comprising the steps of:

(a) detecting a position of an outline in an original picture;

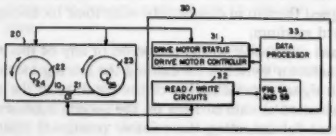
(b) comparing the width of a halftone dot area to be recorded with the detected position of said outline; and

(c) projecting the recording light beam onto the photosensitive material only over the range of the halftone dot area within the outline by selecting the smaller of either the width or outline position as the control signal.

4,321,632
POSITIONING SYSTEM AND FORMATTING SCHEME FOR MAGNETIC TAPE MEDIA

Michael D. Leis, Framingham, and Robert C. Rose, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 44,680, Jun. 1, 1979. This application May 19, 1980, Ser. No. 148,055
Int. Cl.[3] G11B *5/09, 15/18, 15/48*
U.S. Cl. 360—49 **6 Claims**



1. A magnetic tape recording medium for storing digital data in a plurality of addressable record segments and for use in a magnetic tape storage device that includes tape transport means for moving said recording medium selectively at a first speed or at a second, slower, speed, control means connected to the tape transport means for controlling the speed at which said recording medium moves, transducer means connnected to the control means for transferring representations of digital signals to and from said recording medium, and detecting means for detecting predetermined patterns of digital signals, said recording medium comprising:

A. a plurality of prerecorded addressable record segments that store representations of digital signals at a first spatial bit density,

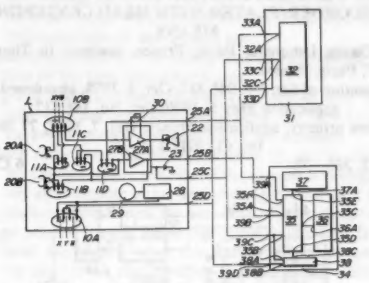
B. prerecorded inter-record mark segments interposed between adjacent pairs of said record segments, each said mark segment storing a representation of a first predetermined pattern of digital signals at a second spatial bit density that is less than said first spatial bit density, and

C. a prerecorded beginning-of-tape segment and a prerecorded end-of-tape segment at first and second portions of said recording medium, respectively, each of said beginning-of-tape and end-of-tape segments storing, respectively, representations of a second and third predetermined patterns of digital signals that are prerecorded at said second spatial bit density, said second and third predetermined patterns being marginally different from each other and marginally different from said first predetermined pattern of digital signals thereby to enable said detecting means to discriminate among passages of said mark segment, beginning-of-tape segment, and said end-of-tape segment even though some bits therein are erroneous.

4,321,633
TAPE RECORDER

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,632
Claims priority, application Japan, Oct. 9, 1978, 53/124503; Oct. 9, 1978, 53/124504
Int. Cl.[3] G11B *15/02, 15/18, 31/00*
U.S. Cl. 360—69 **5 Claims**



1. A tape recorder comprising a two-channel magnetic head, two amplifying circuits, a record-actuating member, a reproduction-actuating member, said members being operable to effect recording and reproducing, and a selecting member operable without releasing said record-actuating member and said reproduction-actuating member so as to select one of different combinations of channels for recording and reproducing to be effected upon operation of said record-actuating member and said reproduction-actuating member, said selecting member having a plurality of selective positions including one selecting position where reproduced outputs from individual channels of said two-channel magnetic head are applied to the amplifying circuits of the corresponding individual channels for enabling simultaneous reproduction of signals of said channels, said tape recorder being adapted to read a magnetic tape having a first track with analog audio signals recorded thereon and a second track with digital control signals recorded thereon, said digital control signals relating to said analog audio signals on said first track and controlling one of said tape recorder and an outside unit connected to said tape recorder, said tape recorder further comprising a reproducing means for reproducing said analog audio signals from said first track, an output terminal for delivering said digital control signals of said second track to the outside unit, and a control

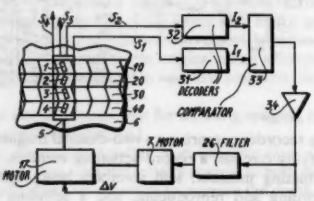
input terminal for receiving control output signals generated by said outside unit based on the digital control signals of the second track, so as to control operation of said tape recorder in response to said control output signals thus received, said outside unit having a microcomputer, a keyboard, and an interface, and said magnetic tape has analog signals representing questions recorded on said first track and digital signals representing at least answers to said questions recorded on said second track, whereby the digital signals of said second track are delivered to the microcomputer of said outside unit through said output terminal, and the tape feeding in said tape recorder is interrupted after storing said digital signals in said microcomputer, for allowing a student to apply his answer to specific one of said questions onto said microcomputer by operating said keyboard and allowing said microcomputer to compare the answer from the student against said answer represented by said digital signals stored in the microcomputer and relating to said specific question, so as to control ensuing tape feeding in said tape recorder depending on result of said comparing by the microcomputer.

4,321,634

ENDLESS MAGNETIC TAPE VIDEO RECORDER/PLAYER WITH HEAD CENTERING MEANS

Jean-Claude Lehureau, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 948,337, Oct. 3, 1978, abandoned. This application May 5, 1980, Ser. No. 146,412
Claims priority, application France, Oct. 7, 1977, 77 30244
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—70 **6 Claims**



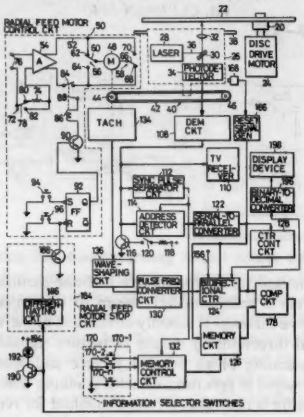
1. A video tape recording and playback device comprising an endless magnetic tape, magnetic head means having at least two gaps stacked across the width of said tape, tape driving means for continuously moving said tape past said magnetic head means, and head moving means for laterally moving said magnetic head means in a direction perpendicular to the direction of transport of said tape; said gaps having axes angularly offset by equal positive and negative values in relation to said direction; said gaps recording along said tape a timing signal on two equally spaced tracks; said magnetic head means supplying two playback signals upon reading out said tracks with two gaps in azimutal alignment with said gaps; phase comparator means being provided for supplying in response to said playback signal a control voltage corresponding to the phase shift between said playback signals; said control voltage being fed back to a control input of said head moving means for cancelling out at playback any lateral offset of said gaps in relation with said tracks.

4,321,635

APPARATUS FOR SELECTIVE RETRIEVAL OF INFORMATION STREAMS OR ITEMS

Hiroshi Tsuyuguchi, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 31,950
Int. Cl.³ G11B *27/28, 17/00, 15/00*
U.S. Cl. 360—72.2 **12 Claims**



1. Apparatus for selectively retrieving a plurality of recorded information streams or items, comprising:

(a) a record medium having a succession of information streams or items recorded along at least one track thereon and also having recorded thereon a series of addresses identifying successive preselected positions on the track, the record medium having further recorded thereon an index to the recorded information streams or items, with the index listing at least the starting addresses of the information streams or items and being recorded prior to the information streams or items;

(b) means for reading the record medium;

(c) means for creating a relative motion between the record medium and the reading means at a selected one of normal and high speeds;

(d) means for storing the index read from the record medium by the reading means;

(e) a plurality of information selector switches to be actuated manually for selecting for playback any of the recorded information streams or items on the basis of serial numbers assigned thereto in conformity with their locations on the record medium;

(f) means responsive to the actuation of any of the information selector switches for causing the storing means to put out a signal representative of the location of the selected information stream or item on the record medium;

(g) means for detecting the relative positional relationship between the record medium and the reading means, the detecting means comprising:

(1) first means for deriving the address-representing output signal from the addresses read from the record medium by the reading means;

(2) second means for deriving the address-representing output signal from the relative motion between the record medium and the reading means; and

(3) selecting means for selecting the address-representing output signal derived by the first deriving means when the speed of the relative motion between the record medium and the reading means is normal, and for selecting the address-representing output signal derived by the second deriving means when the speed of the rela-

tive motion between the record medium and the reading means is high;

(h) means for comparing the output signals from the storing means and from the producing means, the comparing means putting out a signal upon agreement of the two input signals; and

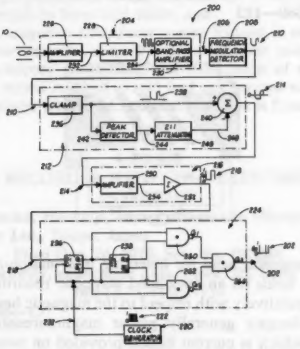
(i) means responsive to the output signal from the comparing means for controlling the creating means to cause the reading means to read out only the selected information stream or item.

4,321,636

CATEYE-SIGNAL INTERCEPT DETECTOR FOR ALIGNING A READ-WRITE HEAD ABOVE A COMPUTER DATA STORAGE DISK

Charles E. Lenz, Omaha, Nebr., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Mar. 17, 1980, Ser. No. 131,261
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **8 Claims**



1. A cateye-signal intercept detector for aligning a read-write head above a computer data storage disk, the detector used in conjunction with a standard test disk having two adjacent cateye-type head alignment tracks thereon, the detector comprising:

a frequency modulation detector connected to the read-write head for receiving the cateye signal and generating an instantaneous output signal proportional to the instantaneous carrier frequency deviation of the cateye signal;

a polarity detector connected to the modulation detector receiving the instantaneous output signal and producing a binary output signal having a logical value 1 when the polarity of the instantaneous output signal is positive and a logical value of zero at all other times; and

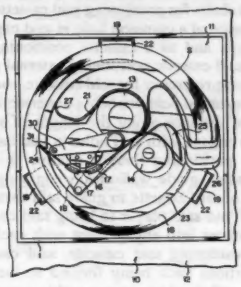
a transition detector connected to the polarity detector for generating a train of selected clock pulses, the output pulse is the second clock pulse present after an instant in which the binary output signal changes state if a sufficient portion of the first clock pulse succeeds the transition of the binary output signal and triggers the transition detector, if the first clock pulse is not sufficient then the detector alternately emits the second complete clock pulse to follow a given transition of the binary signal.

4,321,637

RECORDING-REPRODUCTION APPARATUS FOR AN ENDLESS TAPE

Hiroshi Yamashita; Fumio Izawa, both of Yokohama, and Seiichi Yanagida, Hiratsuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 2, 1979, Ser. No. 90,696
Claims priority, application Japan, Nov. 9, 1978, 53-137325
Int. Cl.³ G11B *15/60, 15/43, 23/06*
U.S. Cl. 360—93 **9 Claims**



1. A recording and/or reproduction apparatus for an endless tape comprising:

a hollow fixed reel including an inner and outer wall, said outer wall being wound with said endless tape;

guide means for conducting the innermost portion of the tape wound about the outer wall of the hollow fixed reel from the inner wall of said hollow fixed reel onto the outermost side of said wound tape;

head mechanism for recording and/or reproducing operation of the tape thus guided; and

a pinch roller and capstan which are driven with the tape held therebetween thereby causing the tape to form a slackened portion downstream of the capstan;

pinch roller drive means for releasing the pinch roller from the capstan before rotation of the capstan is brought to an end and stopping of the tape running occurs, such that the slackened portion of the tape is partly drawn up; and

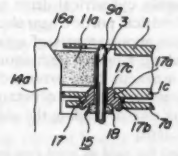
tape portion biasing means for releasing the tape from the head mechanism when the pinch roller is released from the capstan for partly pulling the slackened portion of the tape, such that the slackened portion of the tape is removed after the tape running is stopped.

4,321,638

SUPERMINIATURE CASSETTE TAPE RECORDER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Hachioji, Japan

Filed Jun. 28, 1979, Ser. No. 53,506
Claims priority, application Japan, Jul. 3, 1978, 53/91624[U]
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—96.5 **1 Claim**



1. In a combination of a microcassette and player, said microcassette having on one side thereof a pair of spaced apart

capstan holes for engaging a pair of equivalently spaced capstan shafts provided in said player for operatively positioning said microcassette within said player, said player including a pair of capstan shafts for engaging within said holes, the improvement comprising that said player is formed to include bearings for each of said capstan shafts and a cassette positioning external portion located to extend around each of said capstan shafts and structured separately from said bearings located immediately above said bearings, each of said cassette positioning external portions surrounding said capstan shafts and being arranged to engage within the same hole as each of said capstan shafts for positioning said cassette in said player so that use is made of a common hole in said cassette as a capstan engaging hole and as a cassette positioning hole, with the contour of said cassette positioning external portion operating as a positioning reference for said cassette, each of said cassette positioning external portions being dimensioned to extend only for a limited distance along the length of said capstan shaft sufficient to engage with said holes in said cassette to establish appropriate positioning thereof relative to said player, said player including guide wall means engaging against external wall means of said cassette to guide said cassette during insertion thereof into said player to bring said cassette positioning external portions into engagement with each of said capstan holes for positioning said cassette, said cassette positioning external portions each being formed to include a generally cylindrical wall sized to engage within a portion of said capstan hole defined by an outer wall of said cassette, a flange portion extending to define an abutment surface adapted to be engaged by said outer wall of said cassette when said cassette is fully inserted into said player and a beveled portion arranged to guide said capstan hole into position about said cylindrical portion and to facilitate insertion of said cassette positioning external portion into said capstan hole.

4,321,639

APPARATUS FOR MAGNETICALLY RECORDING AND READING WIDE-BAND SIGNALS

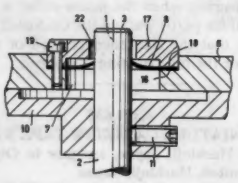
Petrus J. J. Aarts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1980, Ser. No. 115,171

Claims priority, application Netherlands, Mar. 23, 1979, 7902292

Int. Cl.³ G11B 5/52, 21/04

U.S. Cl. 360—104 **6 Claims**



1. An apparatus for magnetically recording and reading wide band signals on a magnetic tape being transported in the apparatus, the signals being arranged in signal tracks which extend obliquely adjacent each other, comprising:

a. an at least partly cylindrical drive spindle having a free end and a cylindrical portion near the free end, the spindle being rotatable about an axis of rotation, the tape being transported along a helical path about the spindle,

b. at least one magnetic head arranged to be rotatable in a circular path around the axis of rotation of the drive spindle for writing and/or reading the oblique signal tracks on the magnetic tape,

c. a head support for said at least one magnetic head having a central bore for mounting the head support on the drive spindle, the support being detachably secured to the cylindrical portion of the drive spindle near its free end, and

d. means for detachably mounting the head support on the drive spindle, and comprising centering means for centering the head support relative to the axis of rotation of the drive spindle, and fixing means for rigidly connecting the magnetic head support and the drive spindle to each other, characterized in that:

the centering means comprise a centering diaphragm made of a thin elastic sheet material, formed with a central opening for tightly fitting the free end of the drive spindle and having such a shape and such dimensions that upon the insertion of the free end of the drive spindle portions of the centering diaphragm adjoining the central opening are subject to an elastic bending deformation in the axial direction as a result of the forces occurring between the centering diaphragm and the drive spindle, and

connecting means for connecting the centering diaphragm to the head support at a location spaced from the central opening of the centering diaphragm such a distance that the portions of the centering diaphragm disposed between the connecting means and the central opening are free to be subjected to the elastic bending deformations.

4,321,640

MAGNETO-RESISTIVE HEAD

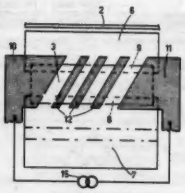
Wilhelmus J. van Gestel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,259

Claims priority, application Netherlands, Apr. 25, 1978, 7804377

Int. Cl.³ G11B 5/30

U.S. Cl. 360—113 **5 Claims**

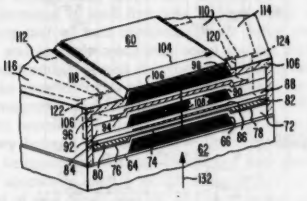


1. A magnetic head for detecting information-representing magnetic fields on an associated magnetic recording medium movable relatively with respect to the magnetic head, comprising an elongate generally planar magnetoresistive reading element which is current biased provided on two oppositely located ends with contacts for the connection to a source of measuring current, which element has such a magnetic anisotropy that the easy direction of magnetization coincides with the longitudinal axis of the element and which comprises at least one electrically readily conductive strip which is provided obliquely on a surface of the element at an angle of at least 30° and at most 60° with the longitudinal axis of the element, characterized in that the magnetic head comprises two components of magnetically permeable material disposed in mutually aligned relationship, between which components a gap is present, the magnetoresistive element spanning said gap, the facing ends of the components of magnetically permeable material covering the edge zones of the magnetoresistive element extending parallel to the longitudinal axis, the end of one of the components of magnetically permeable material remote from the magneto-resistive element being the medium scanning element, said elongate magnetoresistive element being disposed with the plane thereof in generally perpendicular relationship to the direction of movement of the associated medium which cooperates with said head, the edge zones of the magnetoresistive element covered by the ends of the components of magnetically permeable material corresponding substantially with the areas of the element in which the direction of the current lines is not uniform when a measuring current flows through the element.

4,321,641
THIN FILM MAGNETIC RECORDING HEADS

Fred S. Lee, Oklahoma City, Okla., assignor to Magnex Corporation, San Jose, Calif.

Division of Ser. No. 830,104, Sep. 2, 1977, and a continuation of Ser. No. 909,285, May 24, 1978, Pat. No. 4,195,323. This application Dec. 14, 1979, Ser. No. 103,850
Int. Cl.³ G11B 5/16
U.S. Cl. 360—126 8 Claims



1. An improved slider and magnetic transducer head combination comprising:

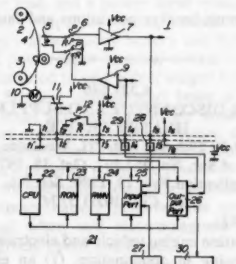
a substrate material formed unitarily as a polyhedral body having a first surface defining a slider flying surface, said first surface having a length at least equal to the desired length of said slider flying surface, and said substrate material further including at least a second surface disposed perpendicular to said first surface at one extreme of said length to form said slider; and

thin film magnetic transducer means formed in situ on said substrate material second surface adjacent said first surface whereby positioning and orientation of said transducer means relative to said first and second surfaces are determined when said transducer means is formed.

4,321,642
DATA RECORDER WITH COMPUTER DISPLAY INTERFACE

Norio Fukuoka, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,346
Claims priority, application Japan, Dec. 26, 1978, 54-000098
Int. Cl.³ G11B 27/36
U.S. Cl. 360—137 2 Claims

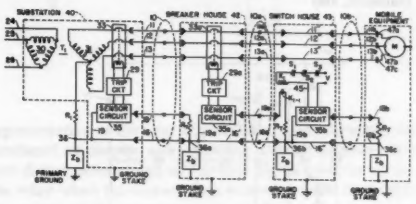


1. A data recorder comprising a tape recorder, a computer unit having a control section, and a display unit coupled to the computer for displaying a change demand of an operation mode when writing in and reading out data by the computer unit if the operation mode of the tape recorder is improper, said tape recorder being a miniature portable device, a plurality of docking terminals in the tape recorder, a plurality of connecting terminals in the computer for connection to the docking of the tape recorder, and means in the computer for sensing the recording-reproducing mode of the recorder and for causing the display unit to indicate a demand for another mode when the detected mode is improper, said docking terminals in the tape recorder and said connecting terminals in the computer being connectable and disconnectable from each other.

4,321,643
GROUND MONITORING SYSTEM

Richard A. Vernier, Princeton, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,217
Int. Cl.³ H02H 5/10
U.S. Cl. 361—48 3 Claims



1. Apparatus for monitoring the condition of the ground conductor of an electrical cable in a power distribution system wherein said cable has power conductors, at least one ground conductor, and a pilot wire or the like, said power conductors being adapted to conduct electrical power at a given frequency, said apparatus comprising

a terminating resistor of known resistance value,

means for connecting one end of said resistor to said pilot wire at one end of said cable,

means for connecting the other end of said resistor to the ground conductor at said one end of the cable,

a sensor circuit coupled between the ground conductor and pilot wire at the opposite end of said cable, thereby to form a loop,

said sensor circuit including means for coupling a sensing signal onto said loop and having means for detecting an open circuit and a short circuit on said loop, said sensing signal having a frequency different from said given frequency,

inductance means for presenting a high, blocking impedance to said sensing signal but not to said power at the given frequency,

means at said opposite end of the cable for connecting said inductance means between said ground conductor and a primary earth ground for the distribution system,

a second inductance means substantially identical to the first-named inductance means,

means at said one end of the cable for connecting said second inductance means in parallel with the first inductance means between the ground conductor at said one end of the cable and a local earth ground.

4,321,644
POWER LINE TRANSIENT LIMITER

Robert G. Brasfield, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 24, 1979, Ser. No. 42,279
Int. Cl.³ H02H 7/20
U.S. Cl. 361—56 3 Claims

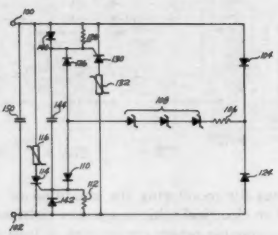
1. A transient limiter for suppressing high voltage transients of either polarity on a power line, which power line normally carries an alternating current having a predetermined peak to peak voltage value, the transient limiter comprising:

a pair of voltage responsive resistance means, each voltage responsive resistance means switching to a low impedance state responsive to a high voltage being applied thereacross;

a pair of silicon controlled rectifiers (SCR's), each SCR having its cathode connected to one of the power line terminals and its anode connected through one of said voltage responsive resistance means to the remaining power line terminal, and the gates of each SCR being responsive to a trigger signal to actuate said SCR to a low impedance state;

voltage sensing means for monitoring the voltage across the line and producing a trigger signal in response to said voltage exceeding a predetermined limit representative of a high voltage transient;

means for applying said trigger signal to a predetermined one of said SCR gates responsive to the polarity of the transient; and



rate control means for capacitively coupling a rate of voltage rise above a predetermined limit on said line directly to a predetermined one of the gates of said SCR's responsive to the polarity of said rate of voltage rise, said rate control means including:

a predetermined value capacitor coupled between the gates of the SCR's;

a pair of predetermined value resistor means, each resistor being connected from one side of the line to one end of said capacitor,

said capacitor and resistor pair forming a differentiator circuit for passing signal transients on said line above said predetermined limit directly to said SCR's.

4,321,645

DIFFERENTIAL FAULT CURRENT PROTECTION OF A MULTIPROCESSOR CONTROLLED ELECTRIC POWER GENERATING SYSTEM

James B. Thom, Rock City, and Richard P. Ejzak, Chicago, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1980, Ser. No. 124,666

Int. Cl.³ H02H *3/32*

U.S. Cl. 361—63 **29 Claims**

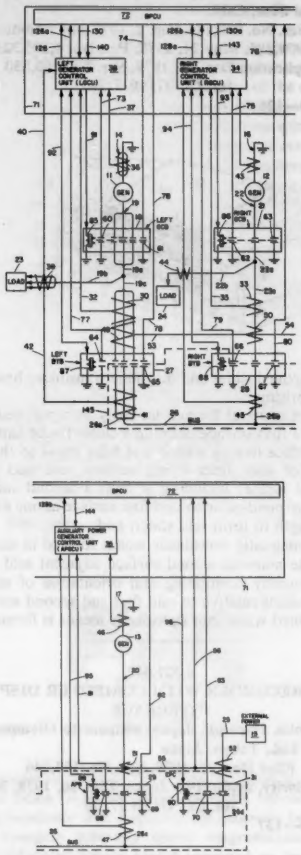
1. A fault current detection, isolation and clearing system for use in an integrated power generating and distribution arrangement having multiple generators electrically connected to loads and to a distribution bus through circuit breakers, said system and arrangement including in combination:

power control logic means;

circuit breaker condition detection means having an output electrically coupled to said power control logic means; and

fault current detection circuit means coupled to the electrical connections of the power generating and distribution arrangement and having an output electrically coupled to said power control logic means;

said power control logic means having an output controllingly electrically connected to said circuit breakers to control said circuit breakers and clear said faults from said power generating and distribution arrangement as a function of circuit breaker conditions and fault currents detected.



4,321,646

VOLTAGE DISCONNECT AND SUPPLEMENTAL HEATER DEVICE

Paul H. Ku, 47-50 59th St., Apt. 2H, Woodside, N.Y. 11377

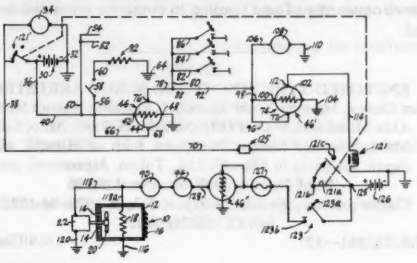
Continuation of Ser. No. 952,292, Oct. 18, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,277

Int. Cl.³ H02H *3/24*

U.S. Cl. 361—92 **6 Claims**

1. A combination engine vehicle and electrical heater circuit device, comprising in combination: (1) an electrical direct current battery circuitry including a primary battery and primary battery positive terminal thereof, and including circuitry leads providable of electrical power to a combustion engine electrical elements and to accessory electrical elements, in which the circuitry leads leading to accessory electrical elements include a first power lead means comprising a low voltage relay connected to break series circuitry powering accessory electrical elements at a predetermined low voltage and to re-establish series circuitry at voltage above said predetermined low voltage, the first power lead means further including a power input low voltage input lead to said low voltage relay and a power output low voltage relay lead connectable to

power accessory electrical elements, and said accessory electrical leads further including an accessory battery providable of wattage of at-least about 3600 watts over a period of at least about two minutes, and battery heater output lead connectable of the accessory battery to a supplemental electrical heater; and (2) a supplementary electrical heating system comprising a direct current electrical heater unit connectable to said accessory battery, and an electromagnetic relay normally-open switch, and first and second low voltage relays, and supplementary circuitry, said supplementary circuitry including a first low voltage relay output lead connected between a power output terminal of said first low voltage relay and a power input terminal of said electromagnetic relay normally-open switch, and an electromagnetic relay ground lead connecting an output terminal of said electromagnetic relay normally open switch to ground, and a closed-switch output terminal of said electromagnetic relay normally-open switch being connected by a first accessory battery lead to a positive terminal of said accessory battery, and a negative terminal of said accessory battery being connected to ground, and said positive terminal of said accessory battery being connected to a power input terminal of said direct current electrical heater unit having its heater unit output terminal connected to ground, and said



second low voltage relay being connected in series with a supplementary heater lead between and connecting said power input terminal of said direct current electrical heater unit and said positive terminal of said accessory battery such that its circuit becomes broken at a predetermined low voltage of electric current to said direct current electrical heater unit such that low voltage of the accessory battery of a degree that would damage the accessory battery is thereby avoided, said electromagnetic relay normally-open switch having a closed-switch power input terminal connected to said accessory battery and heater lead, and a power input terminal of said first low voltage relay output lead being connected to said accessory battery by said accessory battery and heater lead, and a switch-control power-input terminal of said first low voltage relay being connected to said power output low voltage relay lead, and said first low voltage relay being of a type set at a higher low voltage activation point for breaking the power circuit than said predetermined low voltage, said electromagnetic relay normally-open switch being a double-throw switch having a primary battery's positive terminal-to-alternator lead-switch means for alternately breaking and making circuit between said primary battery positive pole and an alternator output terminal when said electromagnetic normally-open switch alternatively opens and closes.

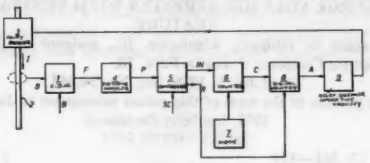
4,321,647

OVERCURRENT RELAYS

Roger G. Fordham, Stafford, England, assignor to The General Electric Company Limited, London, England

Filed Aug. 2, 1979, Ser. No. 62,998
Int. Cl.³ H02H *3/093*
U.S. Cl. 361—97 **8 Claims**

1. A time relay comprising: a device arranged to produce an output having a frequency representative of the instantaneous value of a signal to be monitored by the relay; sampling means responsive to the output of said device for producing a first digital quantity representative of said value at a particular time; comparator means responsive to said first digital quantity to produce an output when said first digital quantity exceeds a predetermined digital quantity; timing means responsive to the output of the comparator to produce a second digital quantity



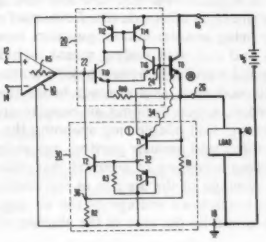
representative of the time elapsed since the comparator means produced an output; and operating means responsive to said first digital quantity and said second digital quantity to operate the relay when the elapsed time exceeds a value dependent on the value of the monitored signal represented by said first digital quantity.

4,321,648

OVER-CURRENT PROTECTION CIRCUITS FOR POWER TRANSISTORS

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,872
Int. Cl.³ H02H *9/02*
U.S. Cl. 361—101 **20 Claims**



1. In an electronic circuit including a protected transistor of first conductivity type having base and emitter electrodes and a base-emitter junction therebetween, and having a collector electrode, means for applying a base drive current to the base electrode of said protected transistor, and means for coupling the collector-emitter current path of said protected transistor to a source of collector-emitter potential and to a load, an overcurrent protection circuit for said protected transistor comprising:

a first transistor of second conductivity type complementary to said first conductivity type, having base and emitter electrodes respectively connected to the emitter and base electrodes of said protected transistor without substantial intervening impedance through which collector-emitter current of said protected transistor flows, having a collector electrode, and having said protected transistor thermally coupled therewith for tracking the operating temperature of said first transistor to that of said protected transistor;

comparator means to which the collector electrode of said first transistor connects for providing an indication of an

overcurrent condition of said protected transistor whenever collector current of said first transistor exceeds a predetermined level; and

means responsive to said overcurrent indication for preventing further increase in said base drive current to said protected transistor.

4,321,649

SURGE VOLTAGE ARRESTER WITH VENTSAFE FEATURE

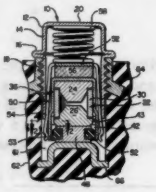
Alexander G. Gilberts, Algonquin, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jul. 5, 1979, Ser. No. 54,667

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—119 **2 Claims**



1. A surge voltage arrester assembly having a primary surge arrester of the cold cathode gas tube type and a secondary surge arrester of the air gap type, the breakdown voltage of the secondary arrester being greater than the breakdown voltage of the primary arrester, said arresters being housed together and being adapted to be connected to form parallel electric circuits from a line to be protected to ground, said secondary arrester having its air gap defined by a surface of an annular portion of a metallic cup that contains said gas tube and a surface of a rim of an electrode that forms part of said gas tube, said air gap being annular in configuration, means sealing said gas tube in said cup, said sealing means including an annular pliable ring and a contact engaging said electrode and projecting through said ring; said contact being spaced from said annular portion, means forming an annular groove receiving said pliable ring, said pliable ring spanning the space between said contact and said annular portion, and at least one of said surfaces having a coating of material that enhances the surge breakdown voltage of the air gap at the coating so that for a given surge breakdown voltage of the air gap, the air gap is wider than would be the case in the absence of such coating.

4,321,650

TELEPHONE CIRCUIT SENSITIVE STATION PROTECTOR

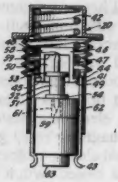
Paul V. De Luca, Plandome Manor, and Michael Fasano, Syosset, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed May 19, 1980, Ser. No. 151,151

Int. Cl.³ H02H *3/22, 9/04*

U.S. Cl. 361—119 **2 Claims**

1. In a telephone building entrance type overvoltage arrestor, including an outer generally tubular housing having an opening at one end thereof, a coil spring positioned within said housing, a cage slideably disposed within said housing and urged by said coil spring towards that opening, and an air gap carbon assembly disposed within said cage, including a disk carbon electrode and a cylindrical carbon electrode supported by a ceramic member, the improvement comprising: said cage having an end wall having a centrally disposed opening therein, a hollow cap-like member disposed within said opening and having a radially extending flange at an open end thereof overlying said opening in said end wall, whereby expansive force of said coil spring is transmitted thereto; a heat sensitive element disposed at least partially within said cap-like member and including a metallic bushing having a bore therein, and an electrically conductive pin fixed within said bore by a meltable material; said carbon disk electrode having



a centrally disposed bore therein, said pin projecting through said bore; whereby upon the occurrence of excess current flow through said arrestor, and the occurrence of arcing caused thereby, heat developed by said arcing is conducted to said bushing to melt said meltable material and allow said cage to move outwardly of said housing to contact a grounded terminal.

4,321,651

ENCLOSED-TYPE ZINC-OXIDE SURGE ARRESTER

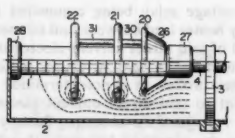
Jun Ozawa, Hitachi; Yoshi Akatsu, Tokaimura; Katsuji Shindo; Akio Mizukoshi, both of Hitachi; Seizo Nakano, Mito; Seiichi Maruyama, and Shingo Shirakawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1980, Ser. No. 116,986

Claims priority, application Japan, Feb. 9, 1979, 54-13222

Int. Cl.³ H02H *3/22*

U.S. Cl. 361—127 **9 Claims**



1. An enclosed-type zinc-oxide surge arrester comprising:

a grounded tank filled with an insulating medium;

a non-linear resistor assemblage disposed within said grounded tank and connected at one end to a high voltage conductor and at the other end to a ground potential member;

a plurality of spaced ring-like shield members disposed between the respective ends of said non-linear resistor assemblage in surrounding relationship therewith within said grounded tank;

means for fixing said ring-like shield members to the high voltage side of said non-linear resistor assemblage in a supporting manner; and

means for electrically connecting said ring-like shield members so that said shield members all have substantially the same potential.

4,321,652

LOW VOLTAGE TRANSFORMER RELAY

Leslie R. Baker, Roseville, and Daniel E. Reisem, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Apr. 30, 1979, Ser. No. 34,381

Int. Cl.³ H01H *51/27*

U.S. Cl. 361—209 **16 Claims**

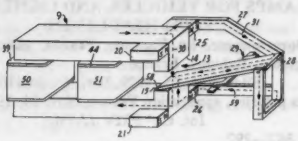
1. An electromagnetic device comprising:

a ferromagnetic core having opposed pole faces defining a gap,

an armature mounted for selective contact with either of said pole faces,

a source of operating flux for establishing a magnetic field in said gap,

a source of latching flux having a surface area A perpendicular to the flux path and a length L along the flux path such that the factor $L/A<1$, thereby providing a low reluctance path for a portion of the operating flux; for retaining said armature in contact with either of said pole faces,



a flux bracket contacting said source of latching flux and contacting said armature for conducting flux therebetween, and

a source of counter flux proximate said gap for confining by-pass flux to said gap.

4,321,653

GROUNDING DEVICE FOR VEHICLES

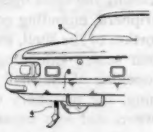
Sakae Takahashi, 1-3-2 Yagiyamahoncho, Sendai-shi, Miyagiken, Japan

Filed Jun. 4, 1980, Ser. No. 156,418

Claims priority, application Japan, Jul. 16, 1979, 54-89327

Int. Cl.³ H05F *3/02*

U.S. Cl. 361—219 **11 Claims**



1. A grounding device for vehicles comprising a flexible strip suspended from the frame of said automobile and contacting at its free end with the ground to said strip, characterized in that said conductive flexible strip is a conductive resilient strip, clamping fixture means attached to the upper portion of said strip for adjustable positioning longitudinally relative to said strip, and weighted reflecting means attached to the lower part of said conductive resilient strip for adjustable positioning longitudinally relative to said conductive resilient strip for weighting the strip to maintain said strip in a substantially longitudinal orientation and for providing a warning signal.

4,321,654

FRAME UNIT FOR ELECTRONIC COMMUNICATION DEVICES

Toshihiko Nakajo, Machida; Yoshihiro Takahashi; Katsuo Okuyama, both of Kawasaki, and Yutaka Matsukuma, Hatano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP78/00002, § 371 Date Aug. 16, 1979, § 102(e) Date Jul. 13, 1980, PCT Pub. No. WO79/00397, PCT Pub. Date Jul. 12, 1979

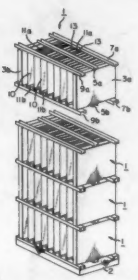
PCT Filed Oct. 20, 1978, Ser. No. 141,083

Claims priority, application Japan, Dec. 16, 1977, 52-150571

Int. Cl.³ H05K *7/18*

U.S. Cl. 361—396 **3 Claims**

1. A frame unit for electronic devices, comprising: a pair of spaced parallel side plates; at least one pair of upper and lower guide rails interconnecting said side plates by extending between and perpendicular to the side plates, both ends of said guide rails projecting beyond the side plates; and a plurality of guide member means for guiding therealong printed boards on which circuit elements of an electronic device are provided, when the printed boards are inserted into and out of the frame unit, said guide member means being secured to said guide rails and being spaced a predetermined distance from one another between and parallel to the side plates, wherein said upper and lower guide rails comprise guide channels, respectively, the



width (L_1) of the guide channel of each upper guide rail being different from the width (L_2) of the guide channel of each lower guide rail, whereby the guide rails having narrower guide channels can be fitted in the other guide rails having wide guide channels when a plurality of frame units are laid one on top of the other, and wherein each of said projecting ends of the guide rails is provided with a mounting hole, and further comprising a plurality of set screw means for insertion in the mounting holes to rigidly connect a plurality of frame units when the latter are laid one on top of the other.

4,321,655

DASH-BOARD WITH REMOVABLE INSCRIPTIONS

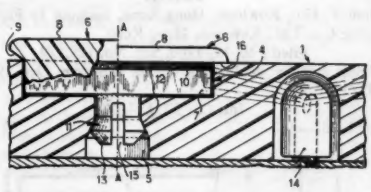
Andre M. Bouvrande, Brunoy, France, assignor to Societe de Telecommunications Electronique Aeronetique et Maritime "TEAM", France

Filed Mar. 18, 1980, Ser. No. 131,441

Claims priority, application France, Mar. 19, 1979, 79 06876

Int. Cl.³ G01D *11/28*

U.S. Cl. 362—29 **10 Claims**



1. A dashboard of the kind comprising a plate made from a material, opacified on one of its faces and inner lighting means, said plate having at least one recess opening into said opacified face, an inscription-bearing cap-like insert member secured within said recess and comprising a translucent element underlying said inscriptions, said element extending into said recess, wherein the improvement comprises that said cap-like insert member is removably secured within said recess, at least one portion of which is translucent, by locking means provided on said cap-like insert including at least one resiliently deformable locking shank portion integral with said cap-like insert member, and corresponding locking means provided in said plate

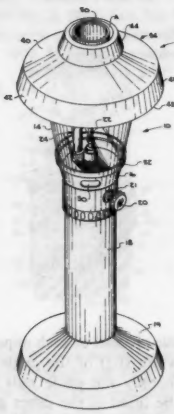
including at least one cavity for receiving said locking shank portion, said cavity opening into the bottom of said recess.

4,321,656

GASEOUS LANTERN VENTILATOR ASSEMBLY

Floyd O. Gruver, Jr., Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 24, 1980, Ser. No. 171,709
Int. Cl.³ F21L *19/00, 19/04*
U.S. Cl. 362—180 **15 Claims**



1. In a hydrocarbon fuel lantern structure including a globe and burner assembly, the improvement comprising a ventilator assembly including:

an outer shell which is circular in shape converging upwardly toward an open end;

a liner concentrically spaced within the outer shell, defining an annular space therebetween, the liner having a circular shape converging upwardly and terminating in an open end which lies in a plane approximate to the plane of the open end of the outer shell;

bracket means on the liner supporting said ventilator assembly on the lantern globe and burner assembly; and

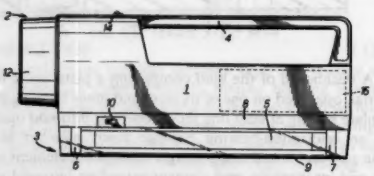
connector means attaching the liner to said outer shell.

4,321,657

TORCH

Cheung T. Hoi, Kowloon, Hong Kong, assignor to Freezinhot Bottle Co., Ltd., Kowloon, Hong Kong

Filed Feb. 11, 1980, Ser. No. 120,129
Claims priority, application United Kingdom, Oct. 19, 1979, 36282/79
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—183 **12 Claims**



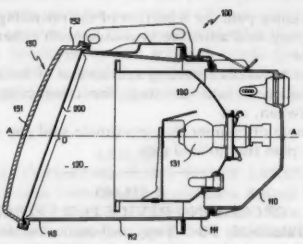
1. A portable torch comprising a body defining a battery case, a first light fitting detachably mounted on the body, a flexible lead connected between the first light fitting and the body, and a second light fitting permanently mounted on the body, said torch including means for causing a first lamp in the second light fitting to flash on and off, said second light fitting being slidably mounted on the body between a first position in which the lamp is concealed by the body, and a second position in which the lamp is exposed, said second light fitting including a second lamp which remains exposed from the body when said second light fitting is in either of said first and said second positions.

4,321,658

HEADLAMPS FOR VEHICLES, AND LIGHT UNITS FOR SUCH HEADLAMPS

Alain Deverrewaere, La Varenne, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Nov. 15, 1979, Ser. No. 94,410
Claims priority, application France, Nov. 24, 1978, 78 33260
Int. Cl.³ F21V *11/06*
U.S. Cl. 362—292 **9 Claims**



1. A vehicle headlamp comprising:

a shell having a front opening through which a beam of light is projected when the headlamp is in use, the shell having a peripheral portion completely surrounding the opening,

a lens completely closing the front opening of the shell, the lens having a peripheral mounting zone cooperable with the peripheral portion of the shell, and

a substantially planar screen extending continuously over the entire front opening of the shell so as to completely cover that opening, the periphery of the screen being sandwiched between said lens mounting zone and said shell peripheral portion along the total circumferential extent of said mounting zone and peripheral portion, and the screen being imperforate and capable of transmitting light without distortion,

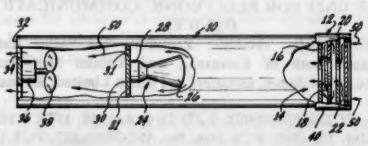
whereby should the lens break, the interior of the shell remains closed and protected by the screen.

4,321,659

NARROW-BAND, AIR-COOLED LIGHT FIXTURE

Ernest E. Wheeler, 5938 Eton Ct., San Diego, Calif. 92122

Filed Jun. 30, 1980, Ser. No. 164,721
Int. Cl.³ F21V *9/00*
U.S. Cl. 362—293 **7 Claims**



1. A light fixture for projecting energy in a narrow spectral range which comprises:

an elongated housing having openings at each end;

a plurality of spaced filters in a pack closing the first end of said housing;

at least one opening in each of said filters adapted to permit air to pass through said filter pack;

said at least one opening of each filter arranged so that no straight line-of-sight exists through openings in all filters in said pack;

said filter pack adapted to allow only energy in a selected spectral range to pass therethrough and to absorb energy out of said range;

a broad spectrum energy source intermediate to the ends of said housing adapted to emit energy towards said filter pack; and

a cooling means adjacent to the second end of said housing adapted to draw air in through a first end of said housing through said filter pack and past said energy source and out said second end of said housing;

whereby energy absorbed in said housing, energy source and filter pack is removed.

4,321,660
UNIVERSAL TROUBLE LIGHT

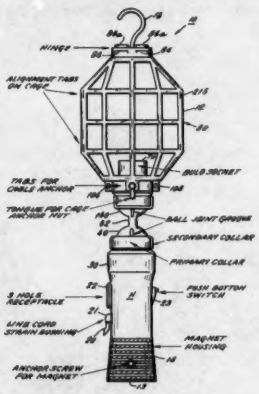
Louis Sokol, Rockville Centre, N.Y., assignor to Plymouth Products Incorporated, Oceanside, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,249

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—368 **10 Claims**



1. A universal trouble light comprising:

a handle section and a bulb carrying section;

said handle extending longitudinally;

a first ball element having a through aperture formed therein and a socket for said ball element adapted to rotatably retain same and be carried by said handle at one end thereof;

said bulb carrying section extending longitudinally;

a second ball element having a through aperture formed therein and a socket in said bulb carrying section for said second ball element adapted to rotatably retain same at one end thereof;

a hollow sleeve member rigidly connecting said first and second ball elements to thereby position said one end of said handle and bulb carrying sections in spaced proximity to each other permitting relative angular movement therebetween;

a bulb receiving socket positioned within said bulb carrying section;

an electrical conductor element extending through the apertures in said ball elements and through said sleeve connecting said bulb socket with a member in said handle section; and

means restricting rotation of each ball element to rotation in a single plane.

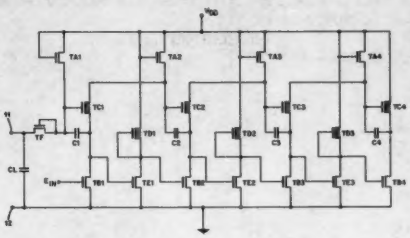
4,321,661
APPARATUS FOR CHARGING A CAPACITOR

Jun-ichi Sano, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 23, 1980, Ser. No. 219,472

Int. Cl.³ H02M *3/18*

U.S. Cl. 363—60 **10 Claims**



1. Apparatus for charging a storage capacitor including

a source of operating potential;

a point of reference potential;

a plurality of stages arranged in order, each stage including capacitance means having first and second terminals,

a first field effect transistor connected between the source of operating potential and the first terminal of the capacitance means, and

a second field effect transistor connected between the second terminal of the capacitance means and the point of reference potential;

each of said stages except the last stage including a third field effect transistor connected between the second terminal of the capacitance means of the associated stage and the first terminal of the capacitance means of the following stage;

the last stage having a third field effect transistor connected between the second terminal of the capacitance means of the last stage and the source of operating potential;

means for coupling the first terminal of the capacitance means of the first stage to one terminal of the storage capacitor;

means for coupling the point of reference potential to the other terminal of the storage capacitor;

control means for applying first or second control signal conditions to said stages;

said first and second field effect transistors being operable in a high conduction condition and said third field effect transistors being operable in a relatively low conduction condition in response to said first control signal condition at said control means whereby each of said capacitance means is connected between said source of operating potential and said point of reference potential and becomes charged;

said first and second field effect transistors being operable in a low conduction condition and said third field effect transistors being operable in a relatively high conduction condition in response to said second control signal condition at said control means whereby the plurality of capacitance means are connected in series between said source of operating potential and said storage capacitor transferring a portion of the charges in the capacitance means into the storage capacitor;

said control means including

a control input terminal connected to the gate electrode of the second field effect transistor of the first stage for receiving said first or second control signal conditions, and

means coupling the gate electrode of the second field

effect transistor of each of said stages except the first stage to the preceding stage.

4,321,662
POWER SUPPLY CIRCUIT FOR ELECTRICAL APPARATUS

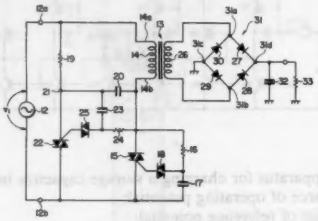
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 12, 1980, Ser. No. 129,642

Claims priority, application Japan, Jun. 29, 1979, 54-82485; Dec. 12, 1979, 54-171827[U]

Int. Cl.³ H02P *13/24*

U.S. Cl. 363—86 **9 Claims**



1. A power supply circuit for an electrical apparatus, comprising: a power transformer having its primary winding adapted for being applied with an AC voltage, and having its secondary winding connected to a rectifying and smoothing circuit, the improvement wherein said power supply circuit further includes:

a switching means, connected in series to said primary winding, for applying said AC voltage to said primary winding of said transformer only for a selected period of time in a half cycle of said AC voltage and for terminating this application of AC voltage before an arrival of zero crossing point of said AC voltage;

said switching means being a circuit comprised of a main thyristor connected in series to said primary winding, a first triggering circuit for triggering said main thyristor, a first capacitor adapted to be charged up as said main thyristor is turned "on" by said first triggering circuit, a second triggering circuit adapted to be actuated after a certain lapse of time as said main thyristor is turned "on", and an auxiliary thyristor adapted to be turned "on" by said second triggering circuit, whereby said first capacitor is discharged of its electric charge as said auxiliary thyristor is turned "on" thereby reversely biasing said main thyristor to turn "off" the main thyristor.

4,321,663
PROCESS OF PULSE DURATION MODULATION OF A MULTI-PHASE CONVERTER

Jan Krtek, Karlovy Vary, Czechoslovakia, assignor to CKD Praha, oborovy podnik, Prague, Czechoslovakia

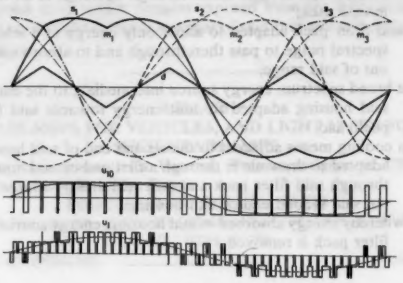
Continuation-in-part of Ser. No. 811,888, Jun. 30, 1977, abandoned. This application May 22, 1979, Ser. No. 41,343

Claims priority, application Czechoslovakia, Jun. 30, 1976, 4319-76

Int. Cl.³ H02M *7/515*

U.S. Cl. 363—137 **6 Claims**

1. A process of pulse duration modulation for improved voltage and frequency efficiency of a multi-phase converter, comprising the step of modulating the pulse duration of the output voltage of each converter phase with the sum of the desired time dependent voltage of the corresponding load phase and of an auxiliary time dependent voltage, wherein the



auxiliary time dependent voltage is identical for all converter phases.

4,321,664
RECTIFIER ASSEMBLY WITH HEAT SINK

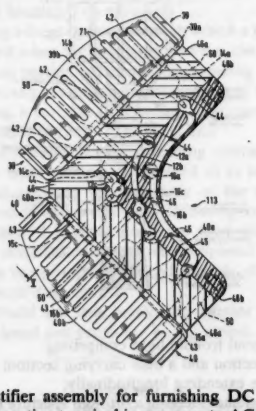
Günter Matthai, Nehren, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,822

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904523

Int. Cl.³ H02M *7/06*

U.S. Cl. 363—141 **24 Claims**



1. In a rectifier assembly for furnishing DC current at a positive and negative terminal in response to AC energization, said rectifier assembly comprising a plurality of first diodes (**14*a*, 14*b*, 14*c***) each having a cathode connected to said positive terminal and an anode, a plurality of second diodes (**15*a*, 15*b*, 15*c***) each having an anode connected to said negative terminal and a cathode, and means connecting said anodes of said first diodes and said cathodes of said second diodes in pairs: a heat sink comprising

at least a first and second U-shaped sheet metal member (**39, 40; 239, 240; 339, 340, 341**) each of said U-shaped members having legs (**39*b*, 40*b*; 239*b*, 240*b*; 339*b*, 340*b***) each of said legs having a plurality of slots (**71**), each of said U-shaped members further having a base;

wherein each of said bases has at least two of said diodes fastened thereto so as to create high thermal conductivity between said diodes and said U-shaped members;

wherein said first diodes are fastened to said first U-shaped member and said second diodes are fastened to said second U-shaped member;

wherein said first and second U-shaped members, respectively, form a conducting member connecting said anodes and said cathodes, respectively, to each other; and

wherein said first diodes and said second diodes extend from said bases of said U-shaped sheet metal members in a direction parallel to the direction of said legs of said U-shaped sheet metal members in a direction parallel to the direction of said legs of said U-shaped sheet metal members;

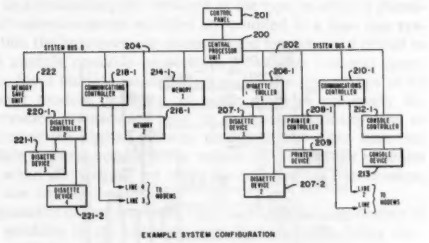
further comprising a V-shaped body (**146**) having said bases of said U-shaped metal members fastened thereto, thereby maintaining said U-shaped sheet metal members in a predetermined position relative to each other.

4,321,665

DATA PROCESSING SYSTEM HAVING CENTRALIZED DATA ALIGNMENT FOR I/O CONTROLLERS

Jian-Kuo Shen, Watertown; John J. Bradley, Framingham, both of Mass.; Richard L. King, Hollis, N.H.; Robert C. Miller, Braintree, Mass.; Ming T. Miu, and Theodore R. Staplin, Jr., both of Chelmsford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 31, 1979, Ser. No. 8,121
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **6 Claims**



EXAMPLE SYSTEM CONFIGURATION

1. A data processing system comprising:

A. a main memory capable of storing a plurality of data words, each data word of said plurality of data words comprising a plurality of data bytes;

B. a common bus, coupled to said main memory, for the bidirectional transfer of information between units coupled thereto, wherein said information includes said plurality of data bytes, said common bus having a data path as wide as said main memory data words and therefore capable of transferring said plurality of data bytes in parallel between units coupled thereto;

C. a central processing unit (CPU) coupled to said common bus;

D. an input/output controller (IOC), coupled to said common bus, capable to sending and receiving data bytes to or from a peripheral device coupled thereto; and

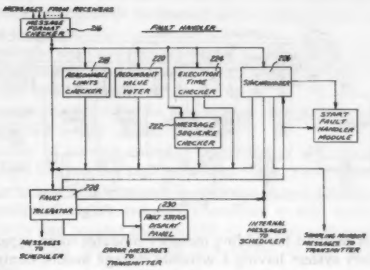
E. first means, included in said CPU, for aligning said plurality of data bytes as they are transferred from said IOC to said main memory and for aligning said plurality of data bytes as they are transferred from said main memory to said IOC wherein the aligning of said plurality of data bytes takes place between transfer cycles on said common bus.

4,321,666

FAULT HANDLER FOR A MULTIPLE COMPUTER SYSTEM

Omur Tasar, Harvard, Mass.; Arliss E. Whiteside, Royal Oak, and Morris D. Freedman, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1980, Ser. No. 118,811
Int. Cl.³ G06F *11/00, 11/34*
U.S. Cl. 364—200 **35 Claims**



34. A fault handler for each computer in a fault-tolerant multiple computer system wherein each computer is assigned a set of tasks it is capable of selecting and executing, each computer including a scheduler for selecting the task to be executed and an applications computer for executing the tasks selected by the scheduler, and wherein each computer sends message to every other computer including task selected messages identifying the tasks it has selected, task data value messages containing the values of the data variables resulting from the tasks it has executed, and error messages containing the identification of the computers which sent messages having detected errors, said fault handler comprising:

checker means for checking for errors each message received from all the computers to generate error signals identifying each computer which sent a message containing an error;

a fault status table storing the current fault status of each computer in the system;

check error message agreement means for counting for each computer the number of other computers which have identified it as being faulty in response to said error messages received from said other computers through said checker means, said check error message agreement means further including means responsive to the receipt of said error messages from a predetermined number of the computers to record as faulty in said faulty status table each computer which at least a predetermined number of other computers agree is faulty;

means for monitoring the time required by each computer to execute its selected task in response to sequentially receive completed/started messages identifying the task completed and the new task started by the applications computer to generate said error signals identifying each computer whose time for executing the identified task exceeds a predetermined time;

record error means for recording as faulty in said fault status table each computer identified in said error signals;

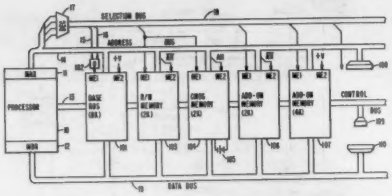
pass message means receiving the messages from said checker means for passing on to the scheduler all error free mesages received from nonfaulty computers and for discarding all messages received from computers recorded as faulty in said fault state table; and

means for sending to all of the computers said error messages in response to said record error means and said check error message agreement means recording a computer as being faulty in said fault status table, said error message identifying to all of the other computers the computer recorded as faulty.

4,321,667
ADD-ON PROGRAMS WITH CODE VERIFICATION AND CONTROL

Wayne E. Robbins, Longmont, Colo.; Paul R. Spivey, Winchester, Ky., and Terence Travis, Boulder, Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 31, 1979, Ser. No. 89,799
Int. Cl.[3] G06F *13/06*
U.S. Cl. 364—200 8 Claims



1. A method for adding memory modules to an expandable memory system having a writable storage means, control bus means for conducting control signals, data bus means for conducting data signals, and address bus means for conducting signals representative of addresses, comprising the steps of:

establishing a given boundary address value for each memory module;

coupling each added memory module to said address bus, to said data bus, and to said control bus;

providing each added memory module with valid stored data including at a first given storage location stored data representative of a predetermined reference value;

storing in said writable storage means a validity signal corresponding to each memory module in the system, said validity signal for a respective memory module having one value when said respective memory module is active and having another value when said respective memory module is inactive; and

executing a program in an added memory module by a calling program comprising the steps of:

(1) checking the validity signal of a given added module,

(2) reading data from said first given storage location of said given added memory module if said validity signal indicates that the given module is active,

(3) comprising the data from step 2 to a given reference value,

(4) transferring program control to said given added module if the comparison step yields an equal result, and

(5) returning program control to a next step in the calling program after execution of the instructions in the added module.

4,321,668
PREDICTION OF NUMBER OF DATA WORDS TRANSFERRED AND THE CYCLE AT WHICH DATA IS AVAILABLE

Richard T. Flynn, Peoria, and Jerry L. Kindell, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 223
Int. Cl.[3] G06F *9/34*
U.S. Cl. 364—200 18 Claims

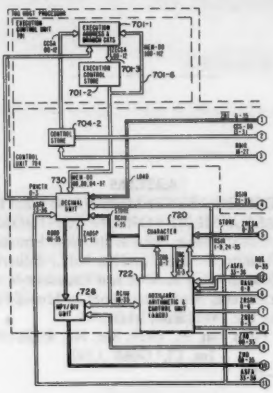
1. A data processing system comprising:

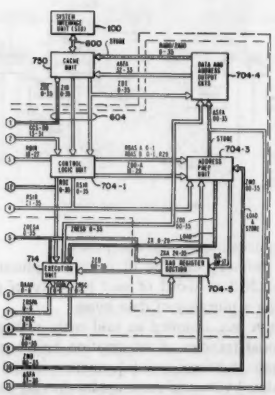
a cache memory for storing operands and instructions, each of said instructions including an operation code portion and also including descriptor information for describing characteristics of said operands;

an execution control unit for storing microwords for executing operations specified by said instructions;

a control unit coupled to said cache and to said execution control unit, said cache and said control unit being responsive to said microwords for transferring one of said instructions and said descriptor information specifying a decimal numeric operation to said control unit from said cache, said control unit being responsive to said microwords for transferring said operation code portion of said one of said instructions to said execution control unit for selecting a series of said microwords for executing said decimal numeric operation;

a decimal unit coupled to said control unit and said cache including control means for receiving said descriptor information and operand processing means for receiving said operands in response to said series of said microwords for stripping decimal digits from said operands and packing said decimal digits into a plurality of words in accordance with said descriptor information, said decimal unit including adder means responsive to said descriptor information for indicating if said operands are short operands by shifting decimal digits from said long and short operands and packing said decimal digits into words;





an execution unit coupled to said decimal unit for receiving said words in response to said series of microwords and performing said decimal numeric operation;

wherein said control means being responsive to said descriptor information and a plurality of status flag signals generated in response to a selected field of said series of said microwords further generates a plurality of vector branch signals indicative of the number of words of said short operands and of the number of cache memory cycles

between a first word of said short operands being requested by said microwords, and a first word of said plurality of words being received by said execution unit in advance of said decimal unit receiving said short operands from said cache;

said execution control unit being further coupled to said decimal unit, and being responsive to said plurality of vector branch signals for branching to a subroutine of said series of said microwords, for processing said short operands.

4,321,669

MICROCOMPUTER NETWORK HAVING SEVERAL MICROCOMPUTER MODULES WHICH ARE COUPLED ONTO AT LEAST ONE SYSTEM BUS

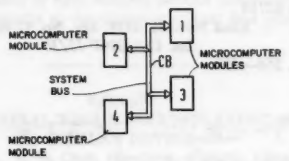
Richard Macmillan, Kolbermoor, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,468

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846925

Int. Cl.³ G06F *9/46, 15/16*

U.S. Cl. 364—200 **6 Claims**



1. In a microcomputer network of the type in which a plurality of microcomputer modules are coupled to a least one system bus, the improvement comprising at least one test circuit in each module operable to perform a resource test and determine, for a module requiring access to the system bus as an initiator module, whether all other modules are ready for information transmission and to perform a priority test to determine the highest priority module when more than one module requests access to the system bus as initiator modules and when all modules are ready for information transmission, said test circuit comprising

a plurality of first terminals equal in number to the number of modules in the network, said first terminals being connected to said system bus,

a plurality of resource lines and a plurality of priority lines connectible to said first terminals,

a second terminal connected to the system bus for receiving a first signal indicating said resource testing and a second signal indicating said priority testing,

a third terminal connected to the system bus for receiving a third signal indicating information transmission and a fourth signal indicating no information transmission,

a priority request line connectible to said second terminal,

a plurality of information data lines connectible to said first terminals,

an information transmission flag register including an input for receiving a fifth signal indicating termination of information transmission, and connected to said third terminal for providing said fourth signal in response to said fifth signal, a plurality of first switches connected to said information transmission flag register and operable to connect said resource lines to said first terminals,

a plurality of said second switches connected to said information transmission flag register and operable to connect said priority lines to said first terminals,

a plurality of third switches connected to said information transmission flag register and operable to connect said information data lines to said first terminals,

an activity flag register including an input for receiving a sixth signal indicating a running operation of a respected module and a seventh signal indicating termination of such operation,

a plurality of fourth switches connected to said activity flag register and operable to connect and disconnect said resource lines to said first terminals in response to said sixth and seventh signals,

a module identification register including an input for receiving module identification signals,

a plurality of fifth switches connected to said identification register and operable to connect said resource lines to said first terminals,

a plurality of sixth switches connected to said module identification register and operable to connect said priority lines to said first terminals,

a resource priority selection flag register including an input connected to said second terminal,

a plurality of seventh switches connected to said resource priority flag register and operable to connect said resource lines to said first terminals in response to said first signal,

a plurality of eighth switches connected to said resource priority flag register and operable to connect said priority lines to said first terminals in response to said second signal,

a data input for receiving data signals,

comparison logic means connected to receive data from said data input and signals at said first terminals, said data signals representing a combination of initiator and resource modules, and operable in response to successful resource testing to emit an eighth signal representing a successful resource test,

a priority request flag register including a priority request input for receiving a ninth signal indicating an information transmission request and for receiving said eighth signal,

a ninth switch connected to said priority request flag register and operable to connect the same to said second input to operate said resource priority flag register in response to said eighth signal to connect said priority request lines to said first terminals, and

a plurality of tenth switches selectively connected to said priority lines to define module priority, said ninth switches connected to and selectively operated by the signals at said first terminals to switch the priority lines of all but the highest priority module in effect.

4,321,670

METHOD OF MERGING INFORMATION ON STORAGE MEDIA

John P. Timmons, White Plains, N.Y., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 600,763, Jul. 31, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,263

Int. Cl.³ G06F *7/22, 9/00, 15/00*

U.S. Cl. 364—300 **14 Claims**

1. A method of merging and rewriting, on a given section of storage media, information contained in related data records recorded on a plurality of sections of storage media, comprising the steps of:

(a) reading the data records recorded on the first of said plurality of sections of storage media and sequentially rewriting said data records in alternating relationship with dummy data records on said given section of storage media;

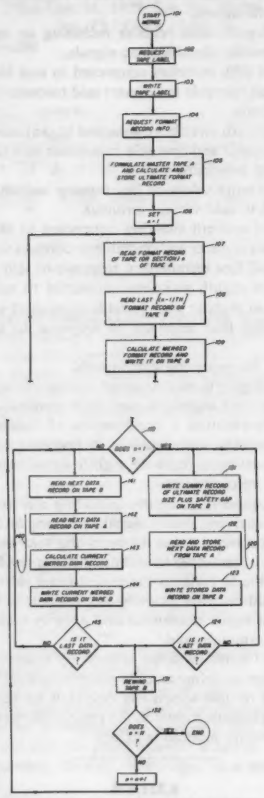
(b) reading related data records respectively recorded on the next of said plurality of sections of storage media and said given section of storage media, and merging the information therein;

(c) writing the merged information onto the dummy data records on said given section of storage media to obtain current merged data records therein;

(d) reading related data records recorded on the next of said plurality of sections of storage media and in the last-

recorded merged data records on said given storage media, respectively, and merging the information therein;

(e) writing the latest merged information onto said given section of storage media as current merged data records,



said current merged data records occupying the alternate positions between the last-recorded merged data records; and

(f) repeating steps (d) and (e) for each remaining of the plurality of sections of storage media.

4,321,671

BANK NOTE DISPENSING METHOD AND APPARATUS

Kyoichi Ohsako, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

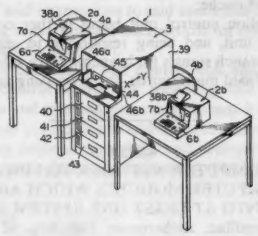
Filed Dec. 27, 1979, Ser. No. 107,562

Claims priority, application Japan, Dec. 28, 1978, 53-164844; Dec. 28, 1978, 53-164846

Int. Cl.³ G07D *1/00*

U.S. Cl. 364—405 **4 Claims**

1. A bank note dispensing method comprising the steps of: keying a key input unit to feed as an input the sum of money requested; classifying the input sum into the sum to be manually dispensed and into the remaining sum which is the remainder of the subtraction of the manually payable sum from said input sum; discharging said remaining sum with the bank notes either in preset denominations or in such denominations as are specified by the keying step of said key input unit; temporarily storing the discharged remaining sum of the bank notes automatically in a temporary storing place; and keying said key



input unit to feed said manually payable sum as an input so that said remaining sum of the bank notes stored can be taken out.

4,321,672

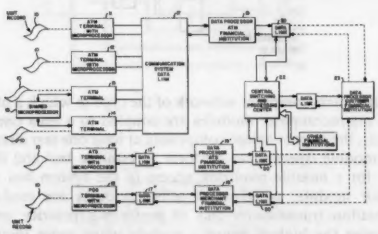
FINANCIAL DATA PROCESSING SYSTEM

Edward L. Braun, 4169 Via Marinia, #412, Marina del Rey, Calif. 90291, and Eric A. Thomson, No. 7 Harrisburg, Irvine, Calif. 92714

Filed Nov. 26, 1979, Ser. No. 97,400

Int. Cl.³ G06F *15/30*

U.S. Cl. 364—408 **82 Claims**



1. The method of effecting a financial transaction involving a financial institution and a customer of the institution comprising the steps of:

making entries on a unit record detailing a portion of the transaction, the entries being made by the customer;

transmitting the unit record information to the financial institution; effecting automatic funds transfer at the financial institution from the transmitted unit record information; and

recording summary information as to the transaction on the unit record under control of the financial institution whereby electronic funds transfer is effected without rehandling of the unit record and the customer retains the unit record as evidence both of his intention and the actual completion of the transaction.

4,321,673

ELECTRONIC GAME

Ebrahim Hawwass, 2204 Chapman Dr.; Hassan Hawwass, 1317 Exley Ave., both of Las Vegas, Nev. 89104; John Nassif, 2314 Union Ave., Altoona, Pa. 16602; Victor A. Cajal, 602 Shannon Ave., Melbourne Beach, Fla. 32951, and Kenneth T. Krone, 2727 E. Oakland Park Blvd., Fort Lauderdale, Fla. 33306

Filed Jan. 22, 1980, Ser. No. 114,449

Int. Cl.³ A63B *71/00*; G06F *15/28*

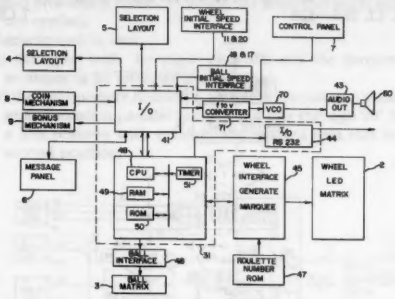
U.S. Cl. 364—412 **19 Claims**

1. An electronic game comprising,

(a) a first plurality of light emitting members arranged in a circle,

(b) a second plurality of light emitting devices arranged in substantially matrix formation to form an annulus within said first plurality of members and arranged in sectors, and

(c) control means selectively operating individual ones of said first plurality of light emitting members consecutively in a



first direction at a calculated initial rate and calculated decreasing rate thereafter and each of said sectors of said second plurality of light emitting devices consecutively in a direction opposite to the direction of said first plurality of members.

4,321,674

NUTRITIONAL VALUE ACCUMULATING AND DISPLAY DEVICE

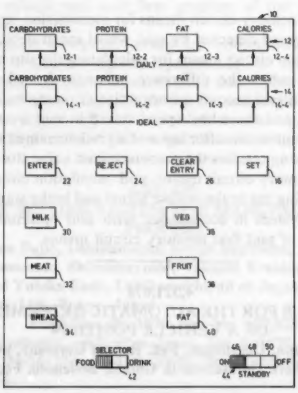
Lester Krames, 71 N. Oval, Hamilton, Ontario, Canada (L8S 3Y9), and Kyong Kim, 1087 Parthia Crescent, Mississauga, Ontario, Canada (L5L 2L3)

Filed Jun. 16, 1980, Ser. No. 159,976

Claims priority, application Canada, Jun. 20, 1979, 330159

Int. Cl.³ G06F *15/42*

U.S. Cl. 364—413 **10 Claims**



1. A device for accumulating and displaying nutritional values comprising:

(a) first and second display units, each having at least two display sections, namely a calorie display section and another food value display section,

(b) a keyboard for entering food items,

(c) control and memory means coupled to said keyboard for assigning a calorie value and said other food value to each food item keyed in on said keyboard,

(d) new entry storage means coupled to said control and memory means for receiving the calorie value and said other food value of a new food item keyed in on said keyboard,

(e) means connecting said first display unit with said new entry storage means and with said control and memory means for said first display unit to display the calorie value and said other food value of a food item keyed in on said keyboard,

(f) accumulator means coupled to said control and memory means, to said new entry storage means and to said first display means and operative to accumulate said values for a food item entered on said keyboard with the values of food items previously entered on said keyboard, to produce new total values of calories and said other food value,

(g) said keyboard including enter key means coupled to said accumulator means and to said control and memory means and operative to cause said new total values to be displayed in said first display unit,

(h) desired value storage means coupled to said second display unit and to said control and memory means for storing and for causing said second display unit to display a desired set of calorie and said other food value values;

(i) and comparison means coupled to said accumulator means and to said desired value storage means for comparing the calorie counts in each and for operating an alarm if the calorie count in said accumulator means exceeds the desired calorie count stored in said desired value storage means.

4,321,675

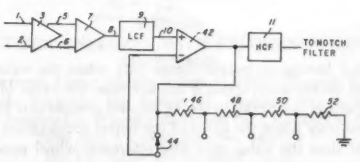
METHOD AND APPARATUS FOR INCREASING THE DYNAMIC RANGE OF A DATA ACQUISITION SYSTEM AT LOW FREQUENCIES WITHOUT REDUCING HIGH FREQUENCY GAIN

Ralph A. Harris, and Paul E. Carroll, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 21, 1980, Ser. No. 113,854

Int. Cl.³ G06C *7/48*; G01V *1/00*

U.S. Cl. 364—421 **14 Claims**



1. In a geophysical data acquisition system with at least one data channel having low noise preamplifier means, filter means and high noise data processing means and cascade combination comprising:

(a) pre-amplifier means comprising a post-filter amplifier and a pre-filter amplifier for amplifying an input signal,

(b) filter means coupled to the output of said pre-filter amplifier, and

(c) high noise data processing means coupled to the output of said post-filter amplifier.

4,321,676

ANTISKID BRAKE DEVICE

Taiji Ohmori, Kawagoe, and Makoto Sato, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,498

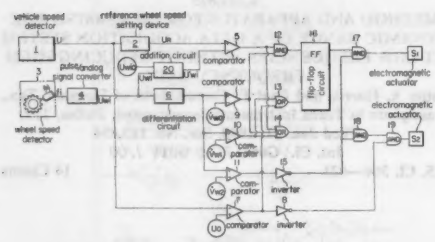
Claims priority, application Japan, Nov. 16, 1978, 53-140497

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **7 Claims**

1. An antiskid brake device for controlling the braking force of wheels during braking while performing a logical operation

process of a wheel speed signal and a vehicle speed signal in the form of an input signal, the device at least comprising wheel speed signal generator means for generating a wheel speed signal in response to the peripheral speed of the wheel; vehicle speed signal generator means for generating a vehicle speed signal in response to the vehicle speed; reference wheel speed signal setting means for setting a reference wheel speed signal in response to said vehicle speed by adding a predetermined slip rate preset on the basis of said vehicle speed signal; signal level adjusting means for adjusting a level of at least one of said wheel speed signal and said reference wheel speed signal so as to uniformly increase a signal level of said wheel speed signal relative to said reference wheel speed signal; first comparator means for comparing said wheel speed signal with said reference wheel speed signal after at least one of these wheel speed signal and reference wheel speed signal has been adjusted in level by said signal level adjusting means; said wheel speed signal generator means having a digital output signal; digital to analog converter means connected to said wheel speed signal generator means for receiving said digital signal and converting said digital signal to a corresponding analog signal; differentiating means connected to the output of said digital to analog converter means and differentiating said analog signal to obtain a wheel acceleration signal, and second comparator means receiving said acceleration signal and comparing said acceleration signal with a reference deceleration signal; said second comparator means comprising a first com-



parator having an output signal only when the value of the wheel acceleration speed is smaller than the value of a reference wheel deceleration signal; second comparator having an output only when the value of the wheel acceleration signal is larger than the value of a first reference wheel acceleration signal; and third comparator having an output signal only when the value of the wheel acceleration signal is larger than the value of a second reference wheel acceleration signal; a fourth comparator having one input connected to said vehicle speed signal generator means for comparing the vehicle speed signal being signaled by said vehicle speed signal generator means with a predetermined relatively low reference vehicle speed signal and having an output only when the value of the vehicle speed signal is smaller than the value of the relatively low reference vehicle speed signal; first AND circuit means having one input connected to said first-mentioned comparator means and having a second input connected to the output of said first comparator; first OR circuit means having one input connected to the output of said second comparator and having a second input connected to the output of said fourth comparator; second OR circuit means having one input connected to the output of said first-mentioned comparator means and having a second input connected to the output of said first comparator, said second OR circuit means having a third input connected to the output of said second comparator; first inverter means connected to the output of said third comparator; and second inverter means connected to the output of said fourth comparator.

4,321,677

ANTI-SKID CONTROL DEVICE

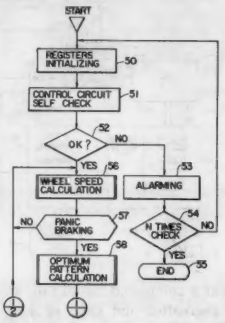
Junichi Takahashi, Katsuta, and Takanori Shibata, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,909

Claims priority, application Japan, Feb. 16, 1979, 54-16128

Int. Cl.³ G06F *15/20;* B60T *8/10*

U.S. Cl. 364—426 **7 Claims**



1. An anti-skid control device for a wheeled vehicle having a wheel speed detector of the vehicle, a brake system of the vehicle for controlling the braking force of the vehicle, and a control circuit which outputs a brake release signal and a brake signal to the brake system in accordance with an output signal delivered from the wheel speed detector, said control circuit comprising:

a first memory circuit means for memorizing beforehand at least one optimum control pattern to control said brake system, said optimum control pattern being expressed as a function of time and vehicle velocity corresponding to a slip rate between the wheel and a road surface, said first memory circuit means further storing a predetermined value,

a second memory circuit means for memorizing temporarily wheel speed detected by said wheel speed detector, and

a calculation circuit means for calculating the slip rate of the vehicle when the difference between the wheel speed stored in said second memory circuit means before panic braking and the wheel speed stored in said second memory circuit means after lapse of a predetermined time from the braking reaches the predetermined value stored in said first memory circuit means, said calculation circuit means outputting the brake release signal and brake signal to said brake system in accordance with said optimum control pattern of said first memory circuit means.

4,321,678

APPARATUS FOR THE AUTOMATIC DETERMINATION OF A VEHICLE POSITION

Uwe Krogmann, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Geratetechnik GmbH, Bodensee, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 904,926, May 11, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,736

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741274; Jan. 29, 1979, 2903282; Jun. 1, 1979, 2922411; Jun. 1, 1979, 2922414; Jun. 1, 1979, 2922415

Int. Cl.³ G06G *7/78;* G01C *19/38*

U.S. Cl. 364—453 **25 Claims**

1. Navigational instrument for a vehicle, wherein the north direction is determined by means of a gyro, comprising:

a two-axis gyro having a spin axis, a first and a second input axis,

a first angle pick-off and a first torquer on the first input axis,

a second angle pick-off and a second torquer on the second input axis,

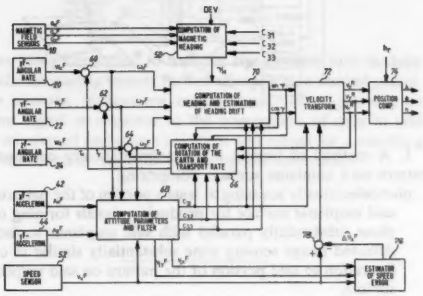
first amplifier means for applying the amplified angle signal from the first angle pick-off to the second torquer, second amplifier means for applying the amplified angle signal from the second angle pick-off to the first torquer, and

signal processing means, to which the amplified angle signals are applied,

characterized in that:

(a) the gyro with the angle pick-offs and the torquers is arranged in an intermediate housing,

(b) the intermediate housing is mounted for rotation about an axis of rotation parallel to one input axis through 90° from a first position with substantially vertical spin axis into a second position,



(c) a pair of vehicle-fixed accelerometers is arranged with its input axes parallel to the transverse and longitudinal axes, respectively, of the vehicle, said accelerometers producing accelerometer signals A_x^F, A_y^F respectively,

(d) the signal processing means comprise

(d_1) first computer means for providing initial vehicle attitude signals from the amplified angle signals with stationary vehicle and said first position of the intermediate housing, and

(d_2) second computer means for continuously providing vehicle attitude signals representing the attitude of the moving vehicle in an earth-fixed coordinate system from said initial vehicle attitude signals, said angle signals from the angle pick-offs and said accelerometer signals with the second position of the intermediate housing.

4,321,679

WORK SETTING SYSTEM FOR MANUFACTURING PROCESS

Masakatsu Fujie, Ushikumachi; Kengo Sugiyama, Abiko; Hiroshi Yamamoto, Shimoinayoshi; Takashi Yoshida, Minorimachi, and Yutaka Endo, Ushikumachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,925

Claims priority, application Japan, Jan. 8, 1979, 54-229; Nov. 2, 1979, 54-141332; Nov. 2, 1979, 54-141333; Nov. 2, 1979, 54-141334

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—474 **6 Claims**

1. A work setting system for setting workpieces with a high degree of precision on pallets that can be mounted on machine tools of a line of machine tools, the system comprising:

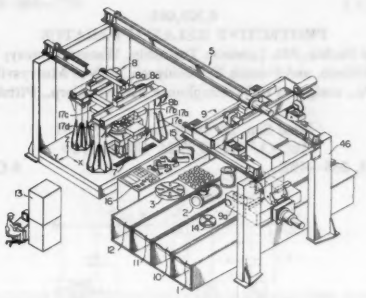
a setting table means for providing a location for setting a workpiece on a pallet, the setting table means being disposed near a conveyor means for transferring pallets to said machine tools;

work centering and clamping means placed around said setting table means for driving positioning jigs and clamping members to be attached on the pallet;

a measuring means provided on said setting table means for measuring dimensions of the workpiece on the pallet in three dimensions by contacting the workpiece and for supplying signals representing the measurements of the workpiece as positioning signals to said work centering and clamping means;

a handling means for handling the pallets, the workpieces and the jigs; and

a control means for controlling said work setting table means, said work centering and clamping means, said measuring means and said handling means in a conversational mode



between a machine and an operator and also for supplying and receiving information exchanged between a control means for the line of machine tools and a central processing means superposing both of said control means, said control means for controlling said work setting table means being capable of obtaining an amount of difference between the position of the workpiece determined by the information from said measuring means and a predetermined standard position of the workpiece, and supplying control signals to said work centering and clamping means for centering and positioning the workpiece.

4,321,680

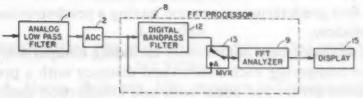
SPECTRUM ANALYZER WITH FREQUENCY BAND SELECTION

John Bertrand, Upper Nyack; Joseph H. Flink, Monsey; Daniel Shamah, Bardonia, and Rodger H. Hosking, Nyack, all of N.Y., assignors to Wavetek Rockland Inc., Rockleigh, N.J.

Filed Apr. 22, 1980, Ser. No. 142,719

Int. Cl.³ G06F *15/31*; G01R *23/16*

U.S. Cl. 364—485 **7 Claims**



1. Spectrum analyzer comprising:

a source of a digital input signal to be spectrum analyzed;

an FFT spectrum analyzer for spectrum analyzing digital signals;

digital bandpass filter means coupled to said input signal source for bandpass filtering said digital input signal;

means coupled to said bandpass filter means for varying at least one of the center frequency of said bandpass filter means and the band width of said bandpass filter means;

switching means for alternately coupling said digital input signal and the output of said digital bandpass filter means to said FFT analyzer for alternately FFT analyzing the digital input signal and the output of said digital bandpass filter means; and

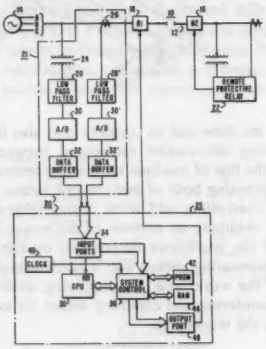
display means for concurrently displaying the analyzed spectrum of said input signal and of the output of said bandpass filter means.

4,321,681

PROTECTIVE RELAY APPARATUS

Milton Sackin, Mt. Lebanon Township, Warren County; David M. Edison, and Francis T. Thompson, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1979, Ser. No. 77,801
Int. Cl.³ H02H *7/26*; G06F *15/56*
U.S. Cl. 364—492 **8 Claims**



1. Protective relay apparatus for providing a trip signal for a circuit breaker in an ac electrical power transmission system when a fault is in the protection zone of the circuit breaker, comprising:

first means providing digital information responsive to predetermined parameters of the electrical power transmission system, including voltage and current, at a predetermined sampling rate,

second means responsive to said digitial information for repetitively determining apparent distance to a fault using a first predetermined process having a predetermined data window,

said second means additionally including comparison means for comparing each determined distance with a predetermined protection zone, with said comparison means providing an in-zone signal when the distance determination is within the protection zone,

third means responsive to said digital information for repetitively determining apparent distance to a fault using a second predetermined process having a longer data window than the first predetermined process,

said third means additionally including comparison means for comparing each determined distance with a predetermined protection zone, with said comparison means providing an in-zone signal when the distance determination is within the protection zone,

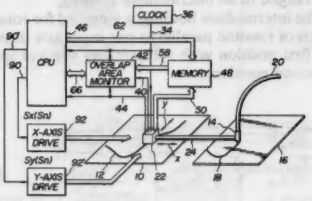
and fourth means responsive to said second and third means for providing a trip signal for the circuit breaker in response to an in-zone signal from either of the second or third means.

4,321,682

METHOD OF AND SYSTEM FOR TRACING MONOCHROMATICALLY CONTRASTING PATTERN

Yukio Koshikawa, Komae, Japan, assignor to Mitsuaki Senbokuya, Kokubunji, Japan

Filed Mar. 28, 1980, Ser. No. 135,851
Claims priority, application Japan, Mar. 30, 1979, 54-038008
Int. Cl.³ G06F *15/20*; G05B *1/00*
U.S. Cl. 364—520 **24 Claims**



1. A method of tracing a monochromatically contrasting pattern on a uniplanar surface, comprising

photoelectrically scanning at least a portion of the pattern on said uniplanar surface for producing signals forming on a plane substantially parallel with said uniplanar surface a detected image sensing zone substantially similar in configuration to said portion of the pattern on said uniplanar surface,

registering pieces of information representative of a predetermined number of modified reference areas each displaced a predetermined distance in a predetermined direction from a prescribed basic area on said plane,

sampling said pieces of information for delivering signals representative of each of the individual modified reference areas,

producing in responsive to the signals representative of said detected image sensing zone and the signals representative of each of said modified reference areas a signal representative of the overlap area over which the detected image sensing zone is overlapped by each of the modified reference area,

selecting from among the individual signals respectively representative of the overlap areas between said detected image sensing zone and said modified reference areas a signal representative of an overlap area satisfying predetermined conditions,

producing a control signal representative of the predetermined direction allocated to the modified reference area corresponding to the signal selected, and

photoelectrically scanning another portion of the pattern on said uniplanar surface depending upon said control signal.

4,321,683

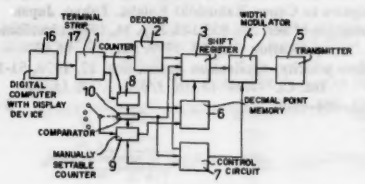
MEASURING SYSTEM FOR ALIGNMENT AND MEASUREMENT WITH AN ELECTRONIC TACHYMETER

Hermann Göring, Jena; Peter Hentschel, and Wolfgang Meyl, both of Dresden, all of German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Aug. 27, 1979, Ser. No. 69,944
Claims priority, application German Democratic Rep., May 25, 1978, 205575
Int. Cl.³ G01C *3/08*
U.S. Cl. 364—561 **4 Claims**

1. In a measuring system for alignment and measuring including a tachymeter station having an electronic tachymeter comprising a calculating means and data transmitting means at the tachymeter station and a receiving device and a pulse integrator at a second station, said tachymeter station further including an information analyzer for analyzing measuring

data from said electronic tachymeter, said information analyzer comprising a decoder, a counter, terminal strip means connected to apply input data to said decoder and counter, a shift register connected to receive signals from said decoder, pulse width modulating means connected to pulse width modulate the output of said shift register, said data transmitting



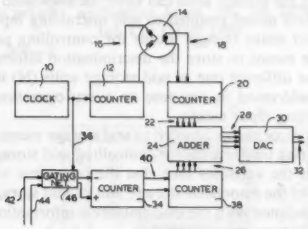
means being connected to transmit signals from said modulator, the measuring system further comprising a second presettable counter, comparison means connected to provide an output signal in response to the comparison of data in said first-mentioned and preset counters, and means for controlling said shift register with the output of said comparator.

4,321,684

DIGITAL RESOLVER

Marcel R. Sommeria, Palos Heights, Ill., assignor to Theleme Corporation, Palos Heights, Ill.

Filed Jul. 16, 1979, Ser. No. 57,590
Int. Cl.³ G06J *1/00*; G05B *1/01*
U.S. Cl. 364—602 **13 Claims**



1. Apparatus for producing an output signal representative of a difference between two values identifying an actual position of a movable member and a programmed position for said member, comprising, in combination,

clock generator means for generating a continuous clock signal, independent of movement of said movable member,

means connected to said clock generator means and responsive to movement of said movable member for generating a first digital operand,

a source of command pulses for programmed movement of said movable member,

means connected to said clock generator means and to said command pulse source for generating a second digital operand,

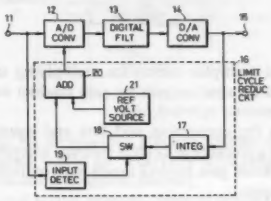
and combining means for arithmetically combining said operands to produce said output signal.

4,321,685

CIRCUIT FOR REDUCING THE LIMIT CYCLE IN A DIGITAL FILTER

Masao Kasuga, No. 1-6-17, Komachi-Douri Sagamihara-City, Kanagawa-Ken; Masaki Satoh, No. 5369, Izumi-Cho, Totsuka-Ku Yokohama-City, Kanagawa-Ken, and Takashi Matsushige, No. 1-40, Fujimigaoka Minomiya-Machi, Naka-Gun, Kanagawa-Ken, all of Japan

Filed Nov. 19, 1979, Ser. No. 95,554
Claims priority, application Japan, Nov. 20, 1978, 53-143179; Nov. 24, 1978, 53-144120; Dec. 25, 1978, 53-158662
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **8 Claims**



1. A circuit for reducing limit cycle in a digital filter arrangement comprising:

an A/D converter supplied with an input analog signal, for producing a pulse-modulated digital signal as output;

a digital filter for digitally processing the digital signal supplied from said A/D converter with an operation of finite word length;

a D/A converter supplied with the resulting output digital signal of said digital filter, for converting the resulting output digital signal thus supplied into an analog signal, to generate an output analog signal;

an input detector supplied with the input analog signal, for detecting the non-existence of the input analog signal, to produce a detection signal;

a first integrator for integrating the output signal supplied from said D/A converter;

a switching circuit responsive to the output detection signal supplied from said input detector, for passing the resulting output signal of said first integrator;

a reference voltage source for producing a reference voltage; and

a first adder for adding the signal thus passed by said switching circuit and said reference voltage supplied from said reference voltage source, to feed back the added signal thus obtained to said A/D converter.

4,321,686

CORRECTION PROCESSOR OF SELF-ADAPTIVE FILTERS

Otakar A. Horna, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 24, 1980, Ser. No. 114,918
Int. Cl.³ G06F *15/31*; H04B *3/22*
U.S. Cl. 364—724 **14 Claims**

1. An adaptive filter system for receiving (i) an input signal to a system to be characterized and (ii) an output signal from said system to be characterized for producing a replica of said output signal, comprising:

(a) delay line means for receiving said input signal and for providing a plurality of delayed outputs of said input signal;

(b) a plurality of adjustable gain control means receiving said plurality of delayed outputs to provide a plurality of adjusted delayed outputs;

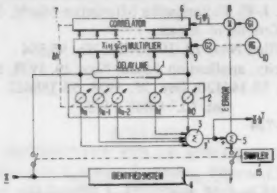
(c) means for summing said plurality of adjusted delayed outputs to provide said replica of said output signal;

(d) means for producing the difference between said replica of

said output signal and said output signal to produce an error signal;

(e) means for providing random numbers;

(f) first multiplication means for multiplying said error signal by said random numbers to produce a first operand;



(g) second multiplier means for multiplying said plurality of adjusted delayed outputs by said random numbers to produce a second operand; and

(h) means for correlating said first and second operands to provide a plurality of control outputs, whereby said plurality of adjustable gain control means are controlled by said control outputs.

4,321,687

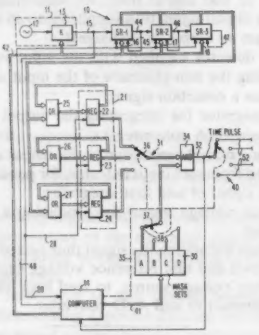
TIMING PULSE GENERATION

Raymond L. Parsons, and Paul H. Paulsen, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,873

Int. Cl.³ G04F *5/00*; G06F *1/04*

U.S. Cl. 364—900 **9 Claims**



1. A timing interval generator;

means for generating clock pulses having a predetermined periodicity;

plural interval means connected to said clock pulse generating means for defining a plurality of timing intervals simultaneously, each interval being a multiple of the periodicity of said clock pulses, each said interval means having a multibit set of signals indicative of a present interval being defined;

plural multibit register means connected to said plural interval means, respectively, for simultaneously memorizing a last measured interval for each of said plural interval means;

plural mask means each for storing a plurality of multibit masks; and

means connected to said plural multibit register means and to said plural mask means for comparing all of said multibit masks in each of said mask means to each of said register means, respectively, for detecting and indicating mask-selected plurality of said intervals when the multibit mask equal to the time interval stored in the interval means.

4,321,688

ELECTRONIC EQUIPMENT CAPABLE OF STATISTIC PROCESSING

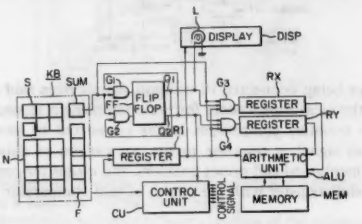
Ichiro Sado, and Shigeru Matsuyama, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 833,343, Sep. 14, 1977, abandoned. This application Oct. 19, 1979, Ser. No. 86,438

Claims priority, application Japan, Sep. 27, 1976, 51-115570

Int. Cl.³ G06F *15/36, 3/023, 3/14, 13/00*

U.S. Cl. 364—900 **5 Claims**



1. Electronic calculating equipment capable of dealing with a statistic numerical information including at least two variables comprising:

numeral input means for entering a numerical information;

instruction input means for entering an information to indicate that the numerical information from said numeral input means is treated as a statistic information;

storage means for storing the statistic numerical information including a plurality of variables, said storage means comprising a plurality of storage units (N) corresponding to the variables in the number, and in each of which storge units the different variable is stored;

status storage means for storing a discrimination information to discriminate said plurality of storage units (N) so that each of the storage units can store the associated variable;

first control means coupled to said instructing input means and said status storage means for controlling said status storage means to store the discrimination information so that the different one of said storage units (N) is sequentially addressed in response to every operation of said instructing input means;

second control means coupled to said storage means and said instructing input means for controlling said storage means to store the variables such that the respective variable is stored in the associated storage unit of said storage means in accordance with the discrimination information of said status storage means; and

visualizing means coupled to said status storage means for visualizing the discrimination information of said status storage means.

4,321,689

SYSTEM FOR CONTROLLING THE DELIVERY OF DATA FROM A DATA SOURCE

Ira Eglowstein, 47 Chaumont Dr., Williamsville, N.Y. 14221, and Peter E. Solender, Williamsville, N.Y., assignors to Ira Eglowstein, Williamsville, N.Y.

Division of Ser. No. 871,778, Jan. 24, 1978, Pat. No. 4,202,265. This application Jan. 28, 1980, Ser. No. 115,796

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—900 **10 Claims**

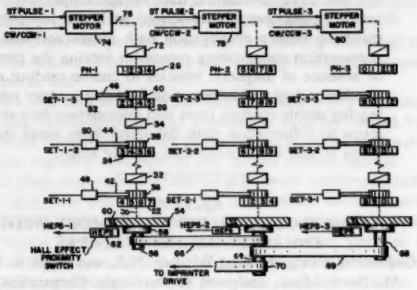
1. A system for controlling the delivery of data from a data source to a plurality of data responsive devices which are cyclically operated which comprises

means providing a plurality of data transferring channels

each for a separate one of said plurality of data responsive devices,

said channels each having a separate memory means which has storage for a succession of items of said data,

means for inputting successive ones of said data items simultaneously to each of said channels once each cycle of operation of said devices, and



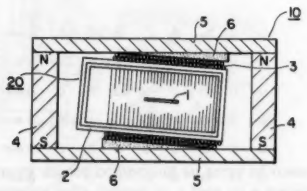
control means for deriving said items from each of said memory means which are in selected positions in said successions also simultaneously once each cycle of operation of said devices and applying said simultaneously derived items simultaneously to each of said devices.

4,321,690

MAGNETIC BUBBLE MEMORY MODULE

Ryo Imura, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 46,027
Claims priority, application Japan, Jun. 16, 1978, 53-72158
Int. Cl.³ G11C *5/04*
U.S. Cl. 365—2 **7 Claims**



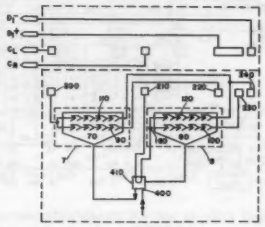
1. A magnetic bubble memory module comprising linear ferrite plates which are arranged in parallel to each other with a spacing therebetween, permanent magnets which are arranged between said linear ferrite plates and parallel to each other with a spacing therebetween, a rotating magnetic field-generating coil assembly which consists of an inner coil and an outer coil and which is arranged aslant to said linear ferrite plates within a space enclosed with said linear ferrite plates and said permanent magnets, a magnetic bubble chip which is arranged in said rotating magnetic field-generating coil assembly, and heat transfer layers which are disposed in interspaces between said linear ferrite plates and said outer coil and which have a high electric resistance and a good thermal conductivity.

4,321,691

REDUNDANT BUBBLE DETECTOR

Robert H. Norton, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 2, 1980, Ser. No. 155,337
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—8 **4 Claims**



1. In a device for propagating magnetic bubble domains,

first and second means for separately stretching magnetic bubble domains propagated thereto;

first and second active magneto-resistive sensors positioned adjacent the first and second stretching means, respectively, and adapted for having a normal operating signal applied thereto for detecting magnetic bubble domains stretched by the first and second stretching means, respectively, and further adapted to be selectively permanently disabled by applying a predetermined destruct signal thereto;

first and second reference magneto-resistive sensors connected to the first and second active magneto-resistive sensors, respectively, the reference magneto-resistive sensors being isolated from the stretching means;

first and second bubble propagation paths having adjacent input ends and having output ends connected to the first and second stretching means, respectively;

a third bubble propagation path having an input end and having an output end positioned adjacent the input ends of the first and second bubble propagation paths; and

a gate having a control conductor connected to the first active magneto-resistive sensor for transferring magnetic bubble domains from the third bubble propagation path to the first bubble propagation path when the operating signal is applied to the first active magneto-resistive sensor and for transferring magnetic bubble domains from the third bubble propagation path to the second bubble propagation path when the first active magneto-resistive sensor has been disabled.

4,321,692

BUBBLE MEMORY SYSTEM HAVING DEFECTIVE MINOR LOOPS

Farooq M. Quadri, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

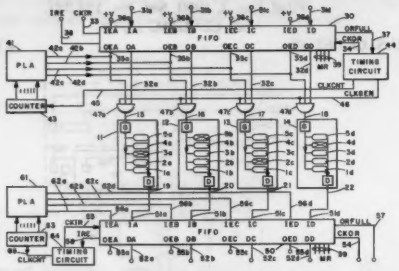
Filed Jul. 9, 1979, Ser. No. 55,993
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **9 Claims**

1. A bubble memory system comprised of:

a plurality of bubble memory chips; each of said chips having a number of minor loops, at least a predetermined portion of said loops being non-defective, and means for transferring bubbles in parallel from all of said loops onto a serial propagation path to a bubble detection means; and

FIFO means having a plurality of data inputs coupled to respective outputs on said bubble detection means of each

bubble memory chips, a corresponding plurality of data outputs, control inputs for selectively loading bits on said



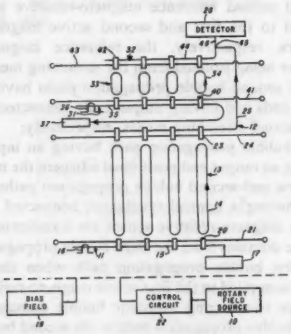
data inputs into said FIFO, and a clock input for removing bits from all of said data outputs in parallel.

4,321,693

MAGNETIC BUBBLE MEMORY CHIP WITH DEDICATED REDUNDANCY DATA SECTION PROVIDED THEREON

Rex A. Naden, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1980, Ser. No. 174,310
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **14 Claims**



1. In a magnetic bubble memory structure, the combination comprising:

a planar layer of magnetic material in which magnetic bubbles can be moved;

a plurality of storage loops on said planar layer of magnetic material defining an information data section for containing information data as represented by magnetic bubbles and voids;

a dedicated area on said planar layer of magnetic material defining a redundancy data section for containing redundancy data as represented by magnetic bubbles and voids arranged in a predetermined manner to identify good and defective information data storage loops, said dedicated area including a plurality of redundancy storage loops disposed on said planar layer of magnetic material for containing redundancy data to identify good and defective information data storage loops;

input/output magnetic bubble propagation path means operably associated with said pluralities of information data storage loops and redundancy storage loops;

means for transferring data as represented by magnetic bubbles and/or voids between each of said information data and redundancy storage loops and said input/output magnetic bubble propagation path means;

means coordinating data propagation of redundancy data from said redundancy storage loops and information data from said information data storage loops on said input/output magnetic bubble propagation path means to enable the redundancy data and the information data to be presented in a proper sequence for identifying the good and defective information data storage loops; and

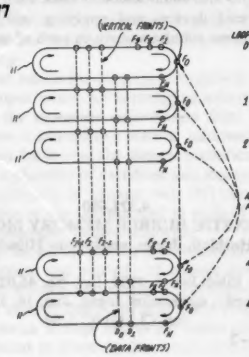
detector means operably associated with said input/output magnetic bubble propagation path means and said data propagation coordinating means for sensing the presence or absence of magnetic bubbles to enable readout of redundancy data and information data in a manner restricting the usable readout from said information data storage loops to information data delivered from good storage loops of said information data storage loops.

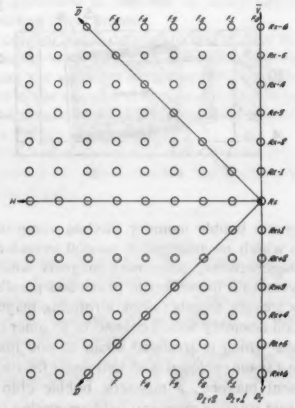
4,321,694

CHARGE COUPLED DEVICE MEMORY WITH ENHANCED ACCESS FEATURES

Godavarish Panigrahi, East Windsor, N.J., and Satish L. Rege, Marlboro, Mass., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 905,425, May 12, 1978, abandoned.
This application Sep. 12, 1979, Ser. No. 74,831
Int. Cl.³ G11C *21/00*
U.S. Cl. 365—77 **3 Claims**





1. A circulating shift register memory system comprising:

a plurality of circulating shift registers arranged as a matrix

having a plurality of rows and a plurality of columns for shifting data in the respective rows from column to column in a circular fashion;

a single access port at each row at one column of said matrix for reading data therefrom and writing data thereto;

addressing means for receiving first control signals representing a selectable starting row-column address of said matrix, and for receiving second control signals representing selectable sequences for addressing said matrix beginning with said starting row-column address;

counter and comparator means for determining when data at the column of said starting address is shifted to said access ports; and

clock and control means for thereafter selectively enabling said output ports as said columns of data are shifted by them to read from/write to said matrix in accordance with the sequence specified by said second control signals;

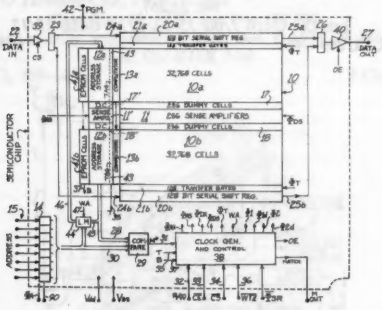
said clock and control means for selectively enabling including a first control means for sequentially enabling said output ports in a horizontal sequence, a second control means for sequentially enabling said output ports in a vertical sequence, and a third control means for sequentially enabling said output ports in a diagonal sequence.

4,321,695

HIGH SPEED SERIAL ACCESS SEMICONDUCTOR MEMORY WITH FAULT TOLERANT FEATURE

Donald J. Redwine, and Lionel S. White, Jr., both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1979, Ser. No. 97,106
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 **23 Claims**



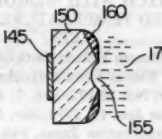
1. A memory device comprising an array of rows and columns of memory cells formed in a face of a semiconductor body, the major part of said array being a data memory and a minor part of the array being an address memory, a commutator for sequentially addressing said rows one at a time and means for reading out address and data from columns when a row is addressed, a serial access register connected via transfer means to the means for reading out to receive data from columns of said array, address input means in said face and connected to receive a multibit address from external to the device, comparator means in said face responsive to an address in said address input means and to said means for reading out and producing a command when the address from external is the same as the address from the array, means to activate said transfer means for the serial access register in response to said command, and output means for reading said data from the serial access register to external to the device.

4,321,696

ULTRASONIC TRANSDUCER USING ULTRA HIGH FREQUENCY

Hiroshi Kanda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1980, Ser. No. 120,884
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—157 **5 Claims**



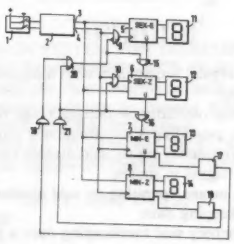
1. An ultrasonic transducer for use at ultra high frequencies comprising: an acoustic wave propagation medium, a piezoelectric element mounted on one surface of the propagation medium, and an ultrasonic lens formed in the opposite surface of the propagation medium and having a predetermined focal distance, said acoustic wave propagation medium having a length in the direction of the axis of said lens which is 1/N (N: odd number greater than one) of the Fresnel focal distance of the transducer.

4,321,697

PROCESS AND CIRCUIT FOR THE SETTING OF AN ELECTRONIC DIGITAL DISPLAY

Alfred Meisner, Nuremberg, and Hans Grasser, Eckental, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,397
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835200
Int. Cl.³ G04C *9/00*
U.S. Cl. 368—187 **5 Claims**



1. In a process for the setting of the electronic digital display of a desired time period, particularly the cooking time of a microwave oven, wherein the setting is effected through a series of stepping pulses, the improvement comprising: subdividing the span of the maximum settable desired time period into a plurality of time periods, and switching forwardly through said stepping pulses the units register and the tens register of a first time unit within a first time period, with a second time period the tens register of said first time unit and the units register of a second time unit superior in time to said first time unit, and within a third time period the units register and the tens register of the superior second time unit, and controlling the setting of the display through synchronizing pulses, blocking the synchronizing pulses for the units register of the first time unit when the units register of the superior second time unit is not equal to zero, and blocking the synchronizing pulses of the units register and the tens register of the

first time unit when the two registers of the superior second time unit are not equal to zero.

4,321,698

TEMPERATURE COMPENSATED QUARTZ WRISTWATCH WITH MEMORY STORED PREDETERMINED TEMPERATURE COMPENSATING DATA

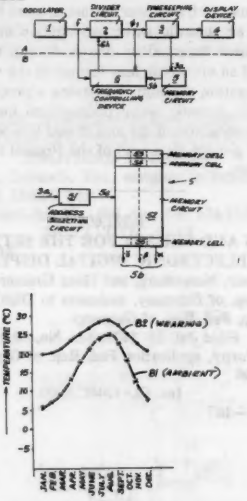
Tsuguo Gomi, and Osamu Takeda, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 10,192, Feb. 7, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 225,933

Claims priority, application Japan, Feb. 7, 1978, 53-12647

Int. Cl.³ G04C *19/00*

U.S. Cl. 368—202 **20 Claims**



1. A quartz crystal wristwatch with temperature compensation, comprising:

a quartz crystal oscillator outputting a high frequency signal;

a divider for providing a low frequency output signal from said high frequency signal, said divider reducing said high frequency signal in stages;

timekeeping means operating on said divider output to provide timekeeping data;

a display whereby said timekeeping data is presented to the user;

memory means having a plurality of addresses for storing predetermined temperature compensating data in said plurality of addresses, said predetermined temperature compensating data being representative of the mean wearing temperature of said wristwatch at a given time of year, said predetermined temperature compensating data stored in said memory means being independent of changes in ambient temperature, said memory means receiving signals of said timekeeping data from said timekeeping means and outputting signals representative of said temperature compensation data; and

means for applying said outputted signals from said memory means to said divider, whereby the rate of said timekeeping data is modified in accordance with the temperature compensating data representative of the mean wearing temperature of the wristwatch at the given time of the year.

4,321,699

WRIST WATCH WITH ALARM

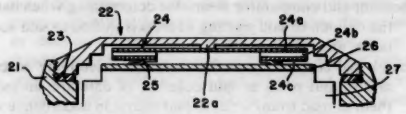
Nobuo Toyama, and Shigekazu Takahashi, both of Ena, Japan, assignors to Ricoh Watch Company, Limited, Aichi, Japan

Continuation-in-part of Ser. No. 833,148, Sep. 14, 1977, abandoned. This application Jun. 27, 1980, Ser. No. 163,686

Claims priority, application Japan, Sep. 17, 1976, 51-112200; Oct. 23, 1976, 51-142973

Int. Cl.³ G04C *21/16*

U.S. Cl. 368—255 **11 Claims**



1. A wrist watch with alarm means for producing alarm sound by a vibratory plate formed of a piezoelectric element strained with AC voltage applied thereto for generating vibrations, said piezoelectric element having a base electrode attached to one side thereof and other electrodes attached to the other side thereof in such a manner as to form the vibratory plate, said vibratory plate being fixed at a single point on the inner side of a central plane portion of an exterior bottom housing of the wrist watch, thereby the vibration of said vibratory plate being transmitted to said bottom housing.

4,321,700

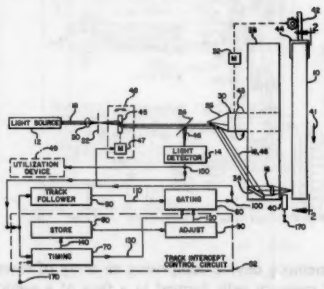
OPTICAL TRACK SEGMENT INTERCEPT APPARATUS

James T. Russell, Richland, Wash., assignor to Digital Recording Corporation, Wilton, Conn.

Continuation of Ser. No. 870,642, Jan. 19, 1978, Pat. No. 4,163,600, which is a division of Ser. No. 727,369, Sep. 27, 1976, Pat. No. 4,090,031, which is a continuation of Ser. No. 516,453, Oct. 21, 1974, abandoned. This application Apr. 23, 1979, Ser. No. 32,367

Int. Cl.³ G11B *7/00, 15/52, 3/74;* G02B *27/17*

U.S. Cl. 369—44 **16 Claims**



1. An optical playback apparatus for reading data recorded on an optical data record in a plurality of spaced-apart data track segments, comprising:

light beam forming means for forming a light beam;

scanning means for scanning said light beam across said record in a scanning direction from a beginning point to an end point along a scanning path to intermittently scan successive track segments, the beginning and end points of successive segments being different, said path having a width corresponding to the width of said track segments, said scanning means having at least one optical element causing said light beam to move along said scanning path to modulate said light beam in accordance with the optical data on said record;

light detector means for detecting said modulated light beam

and producing an output signal corresponding thereto; and

track segment intercept means for causing said light beam to intercept a selected one of said track segments at an intercept position to begin scanning said track segment, said intercept means including:

deflection means between said beam forming means and said record for deflecting said light beam transversely to the scanning direction;

storage means for storing a discrete element of information corresponding to an amount by which said scanning light beam must be deflected transversely of said scanning path to intercept said selected track segment near the beginning point thereof, said amount including a non-integer multiple of the transverse spacing of the track segments;

adjust means for producing an adjustment signal corresponding to said stored information and briefly applying said signal to said deflection means to cause it to deflect said light beam transversely by said amount to said intercept position so that said light beam intercepts said selected track segment near its beginning point preparatory to the scanning of said selected segment.

4,321,701

DEVICE FOR DISPLACING THE READING HEAD OF A VIDEO DISC IN RADIAL AND VERTICAL DIRECTIONS

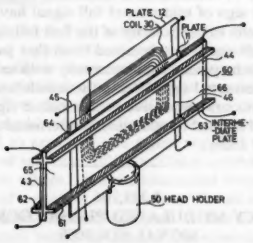
Louis Arquie, and Claude Bricot, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 10, 1979, Ser. No. 101,505

Claims priority, application France, Dec. 8, 1978, 78 34649

Int. Cl.[3] G11B *7/08*

U.S. Cl. 369—45 7 Claims



1. A device for displacing an optical reading head for reading information recorded on a circular track carried by a medium in the form of a disc, wherein said device comprises:

a magnetic circuit having at least one flat air-gap extending at right angles to the disc along a radius of said disc above all the turns of the circular track;

a moving system which is capable of displacement within said air-gap and is adapted to carry said optical head;

at least a first electric circuit comprising a plurality of conductor portions at least one portion being parallel to the plane of the disc and placed within said air-gap for causing displacement of the moving system in order to maintain the optical system in focused relation to the track when a current is passed through said at least one portion along an axis at right angles to said disc.

4,321,702

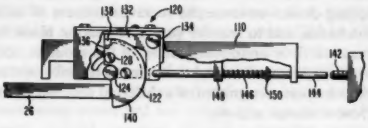
CARRIAGE RESET APPARATUS FOR DISC RECORD PLAYER

Larry M. Hughes, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1980, Ser. No. 129,774

Int. Cl.[3] G11B *17/04, 21/12*

U.S. Cl. 369—77 8 Claims



1. In a player having a pickup means for recovering prerecorded information from a record disposed on a turntable; said pickup means being supported in a carriage which is subject to translatory motion along a path from a starting position toward the turntable center during playback; said record being subject to removable occupancy of a protective cover adapted for insertion into said player; carriage reset apparatus comprising:

(A) a first member secured to said carriage and subject to disposition in an operative position and an inoperative position;

(B) means for selectively latching said first member in said operative position when said carriage is disposed at a position other than said starting position; said first member, when latched in said operative position, being subject to engagement with said cover during said cover insertion to effect travel of said carriage toward said starting position; and

(C) means, responsive to the arrival of said carriage at said starting position, for defeating said latching means to permit disposition of said first member in said inoperative position; said first member, when disposed in said inoperative position, being ineffective to cause further carriage travel during further cover insertion.

4,321,703

TRANSMISSION SYSTEM FOR TELECOPYING AND ELECTRONIC TRANSMISSION OF IN-HOUSE MAIL

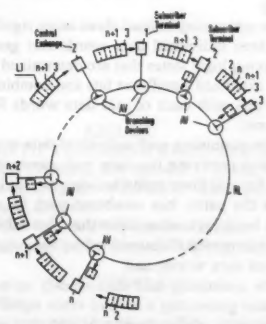
Heinz Schwärtzel, and Hans Unterberger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,145

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842647

Int. Cl.[3] H04J *6/00, 3/02*

U.S. Cl. 370—89 16 Claims



1. In a transmission system for telecopying and for the elec-

tronic transmission of in-house mail, the method comprising the steps of interconnecting a plurality of subscriber terminal devices with a ring circuit by means of a plurality of branching devices individually allocated to said terminals, said terminals being adapted to transmit and receive information blocks according to a fixed frame grid, each of said information blocks including a receiver address, a sender address, and a message, said terminals being adapted to insert an information block within a free time slot of said fixed frame grid, and causing said branching device to sense the receiver address of each information block, and to remove such information block from the information flow upon recognition of the receiver address or the sender address allocated to it, and to transfer said information block upon recognition of a different receiver address and a different sender address.

4,321,704

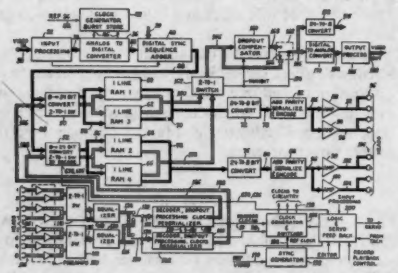
PARITY CHECKING CIRCUITRY FOR USE IN MULTI-BIT CELL PCM RECORDING AND REPRODUCING APPARATUS

Maurice G. Lemoine, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 1, 1980, Ser. No. 117,745

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—51 **5 Claims**



1. Apparatus for generating error indicating signals that can be used for selectively inserting substitute multi-bit data words for data words that are lost or detected to be inaccurate in a received digital data stream of said data words of video information that is transmitted through a data transmission channel, comprising:

means for examining at least three more significant bits in at least three individual data words and generating parity bits having logic states that are determined by the content of the examined significant bits and combining one of said parity bits with each of said data words for transmitting the same;

means for examining said individual data words and parity bits upon receiving the same and generating a first error signal for said three individual data words in the event any one of the parity bits combined with the examined data words has a logic state other than that which would have been transmitted if determined by the original content of received data words; and,

means for examining said data stream upon receiving the same and generating a second error signal in response to the detection of the absence of said data words, said second error signal being generated at least for the duration of the absence of said data words.

4,321,705

DIGITAL EQUALIZER FOR A CROSS-POLARIZATION RECEIVER

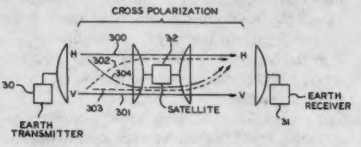
Junji Namiki, Tokyo, Japan, assignor to Nippon Electronics Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,671

Claims priority, application Japan, Mar. 2, 1979, 54-24764; Mar. 2, 1979, 54-24765; Mar. 2, 1979, 54-24768; Jun. 18, 1979, 54-76542

Int. Cl.³ H04B *1/10*

U.S. Cl. 375—14 **13 Claims**



8. A receiver for a communication system which transmits cyclically recurring digital signals over a pair of orthogonally related polarized waves, said receiver having first input terminal means for receiving a horizontal one of said orthogonal signals, second input terminal means for receiving a vertical one of said orthogonal signals, and an output terminal means; an individually associated cascaded plurality of delay circuit means coupled to each of said input terminals, the delay in each of said delay means being equal to the time spacing between said recurring signals, whereby a plurality of said recurring digital signals appear simultaneously at the outputs of each of each of said delay circuits; a variable attenuator means individually associated with the output of each of said delay circuit means for passing an incremental signal responsive to each of the recurring signals appearing simultaneously at the outputs of said delay circuits; adder means for adding each of said incremental signals to produce a first full signal when all of the digital signals received at one of said input terminals appear simultaneously at the outputs of the delay circuits associated therewith, said adder means adding each of said incremental signals to produce a second full signal when all of the digital signals received at the other of said input terminals appear simultaneously at the outputs of the delay circuits associated therewith, the sign of said second full signal having a polarity which is opposite to the polarity of the first full signal whereby said second full signal is subtracted from that part of the first full signal which appears simultaneously with said second full signal, said subtracted signal being the interference in the first signal which occurs responsive to the second signal, whereby only the signal applied to said one input terminal appears at the output of said adder.

4,321,706

FREQUENCY MODULATED PHASE-LOCKED LOOP SIGNAL SOURCE

Kingsley W. Craft, Woodinville, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Jul. 14, 1980, Ser. No. 168,524

Int. Cl.³ H04B *1/04;* H03B *3/04;* H04L *27/12, 27/20*

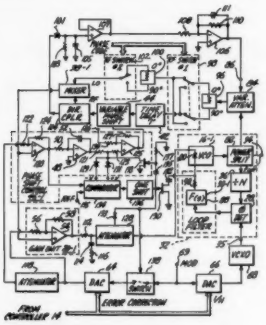
U.S. Cl. 375—59 **14 Claims**

1. A modulated phase-locked loop system comprising:

controlled oscillator means having an output terminal and a frequency control terminal, said controlled oscillator means supplying a signal to said output terminal at a frequency determined by the magnitude of a frequency control signal applied to said frequency control terminal;

a first feedback path responsive to the signal supplied by said controlled oscillator means to said output terminal thereof for supplying a feedback signal to said frequency control terminal of said controlled oscillator means, said first feedback path including a frequency discriminator network including phase detector means having an output

port and first and second input ports and coupling means for coupling said signal supplied to said output terminal of said controlled oscillator to said first and second input ports of said phase detector means, time delay means exhibiting a time delay of τ, said time delay means being connected to delay said signal coupled to one of said first and second input ports of said phase detector means, variable phase shift means having an in-out terminal, an output terminal and a phase shift control terminal, said variable phase shift means being connected to shift the phase of the signal coupled to one of said first and second input ports of said phase detector means by ϕ_e radians, where ϕ_e is greater than a predetermined lower phase shift limit and is less than a predetermined upper phase shift limit, said phase shift ϕ_e being determined by a signal applied to said phase shift control terminal, said frequency discriminator further including stepped phase shift means responsive to an applied phase step control signal, said stepped phase shift means being connected for shifting the phase of the signal coupled to one of said first and second input ports of said phase detector means by $2\ \pi m/k$, where m is an integer determined by said applied phase step control signal and k is a predetermined real positive number; said time delay, said variable phase shifter and said switched phase shifter causing said difference in phase between said signals coupled to said first and second input ports of said phase detector means to be substantially



equal to $2\pi f \pm \phi_e \pm \phi_s$, where f denotes the frequency of said signal supplied to said output terminal of said controlled oscillator means; said phase detector means of said frequency discriminator exhibiting a transfer function of a periodic form that causes said frequency discriminator to supply a signal substantially equal to zero when ϕ_e and ϕ_s are equal to zero and said signal supplied to said output terminal of said controlled oscillator exhibits a frequency of $f_a + n/\tau$, where f_a is a predetermined frequency that is a function of τ and n is an element of the set of nonnegative integers; said first feedback path further including phase shift control means connected for receiving said signal supplied by said frequency discriminator and connected for supplying said control signal to said phase shift control terminal of said variable phase shift means, said phase shift control means including means for inserting the amount of phase shift ϕ_s required to cause said frequency discriminator to supply an output signal substantially equal to zero when said frequency of said signal supplied to said output terminal of said controlled oscillator means is other than $f_a + n/\tau$ and said stepped phase shifter supplies a preselected phase shift that is determinable from the frequency being supplied by said controlled oscillator means; said first feedback path further including signal coupling means for coupling said signal supplied by said frequency discriminator to said frequency control terminal of said controlled oscillator means as a negative feedback signal;

a second feedback path responsive to the signal supplied by said controlled oscillator means to said output terminal thereof for supplying a feedback signal to said frequency control terminal of said controlled oscillator means, said second feedback path including means for phase-locking said controlled oscillator means at a selected carrier frequency, said means for phase-locking said controlled oscillator means including a second phase detector means having an output port and first and second input ports, said first input port of said second phase detector means being coupled to said output terminal of said controlled oscillator means for receiving a signal at a frequency dependent on the frequency of said controlled oscillator means, said second input port of said second phase detector means being connected for receiving an applied reference signal, said output port of said second phase detector means being connected for coupling a signal to said frequency control terminal of said controlled oscillator means;

a first modulation path, said first modulation path including a terminal for application of a modulating signal, said first modulation path being configured and arranged for coupling at least a portion of an applied modulation signal into said first feedback path to modulate said frequency discriminator;

a second modulation path, said second modulation path being connected to said terminal for applying a modulating signal and being configured and arranged to inject at least a portion of an applied modulation signal into said second feedback path to modulate said second phase detector;

modulation compensation means connected in at least said first modulation path, said modulation compensation means including means for adjusting the level of the modulation signal passing through said first modulation path in response to an applied error correction signal, said modulation signal passing through said first modulation path being adjusted on the basis of variations in said transfer function of said frequency discriminator relative to selected carrier frequency; and

controller means responsive to an applied frequency selection signal representing a currently selected carrier frequency, said controller means including means for supplying said error correction signal to said modulation compensation means based on the value of said currently selected carrier frequency, said controller means further including means for supplying said phase step control signal to said stepped phase shift means at a value of m that permits said variable phase shifter to supply a value of ϕ_s that causes said frequency discriminator to supply an output signal substantially equal to zero.

4,321,707

FIBRE-OPTIC COMMUNICATION SYSTEMS

Robin D. Beasley, Chatham, and Edward L. Lewis, Maidstone, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Oct. 4, 1979, Ser. No. 81,626

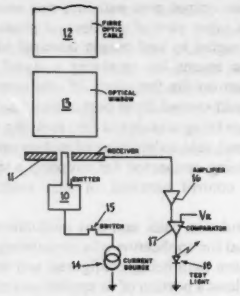
Claims priority, application United Kingdom, Oct. 11, 1978, 40111/78

Int. Cl.[3] **H04B** *9/00*

U.S. Cl. 455—606 **1 Claim**

1. A self testing terminal for use in a fibre optic communication system comprising: an optical emitter; source means for causing said optical emitter to emit a predetermined amount of

light; an optical receiver arranged to receive the fraction of the light emitted by said optical emitter which is reflected back to the terminal from interfaces between adjacent optical components of the terminal or the system; comparator means for comparing a signal representative of the amount of back re-



flected light received by said optical receiver with a signal representative of a reference value amount of light; and signal means arranged to be activated by said comparator if the amount of back reflected light received by said receiver is greater than said reference value.

DESIGN PATENTS

GRANTED MAR. 23, 1982

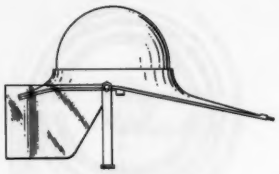
ERRATA

For CLASS	See PATENT NO.
D34–018	263,456
D32–016	263,475

DESIGNS

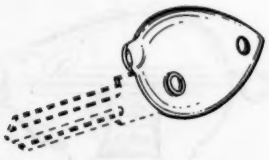
MARCH 23, 1982

263,431
FIRE FIGHTER'S HELMET
Sterling R. Neff, Vienna, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 31, 1979, Ser. No. 108,758
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



263,432
VISION SHIELD FOR A STUDENT TYPIST OR THE LIKE
Gerald A. Amirault, 693 Portsmouth Ave., Kingston, Ontario, Canada (K7M 1W4)
Filed Dec. 21, 1979, Ser. No. 106,282
Claims priority, application Canada, Nov. 21, 1979, 2111791
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—234

263,433
KEY-MOUNTED FLASHLIGHT
Lawrence J. Cunha, 6260 Girvin Dr., Oakland, Calif. 94611
Filed Sep. 24, 1979, Ser. No. 78,495
Term of patent 14 years
Int. Cl. D3—*99*; D26—*02*
U.S. Cl. D3—63

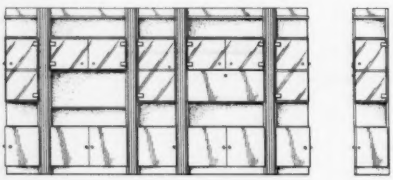


263,434
PATIENT CHAIR
Jack V. Miller, Pasedena, Calif., assignor to Storz Instrument Company, St. Louis, Mo.
Filed Jan. 15, 1980, Ser. No. 112,403
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22

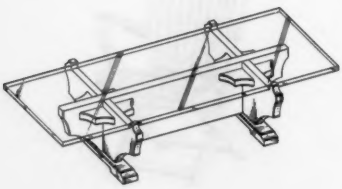
263,435
FOLDING CHAIR
Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation Societe Anonyme, Grenoble, France
Filed Nov. 23, 1979, Ser. No. 96,884
Claims priority, application France, May 22, 1979, 79 2526
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

263,436
SUPPORT STAND FOR A BEDSPREAD
Cecil Greenwold, Los Angeles, Calif., assignor to Spectrafoam Corporation, Los Angeles, Calif.
Filed Apr. 25, 1979, Ser. No. 33,038
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

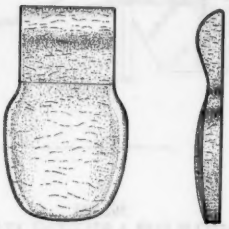
263,437
COMBINED CABINET AND SHELF UNIT OR THE LIKE
Alonzo Parrish, III, Rte. 1, Stedman, N.C. 28391
Filed Apr. 16, 1979, Ser. No. 30,234
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—169



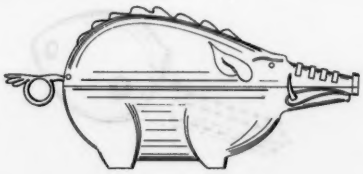
263,438
TABLE
David E. Watson, 6 Summit Ter., Peabody, Mass. 01960
Filed Sep. 18, 1978, Ser. No. 943,010
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



263,439
BACK MASSAGER
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Sep. 27, 1979, Ser. No. 79,505
Term of patent 14 years
Int. Cl. D6—*09*; D24—*04*
U.S. Cl. D6—201



263,440
BARBECUE GRILL HOUSING
Henry A. Feild, 331 E. Nettleton, Jonesboro, Ark. 72401
Filed Feb. 11, 1980, Ser. No. 120,385
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

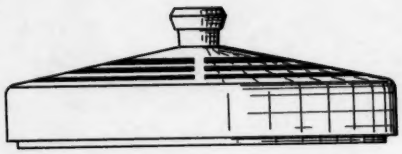


263,441

COOKING UTENSIL COVER OR THE LIKE

Marshall B. Johnson, Chillicothe, and Amos Gott, Columbus, both of Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Feb. 12, 1979, Ser. No. 11,081
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131



263,442

SALAD SERVER

Andre Morin, Montreal, Canada, assignor to Les Industries Provinciales Ltee, St. Damien, Canada

Filed Jul. 9, 1979, Ser. No. 55,599
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

263,443

STRAIGHT-EDGE FOR APPLYING ROWS OF SHINGLES OR SHAKES

Donald K. Reniker, deceased, late of Salem, Oreg., and Frances E. Reniker, administrator, 1830 Childs Ave., NE., Salem, Oreg. 97303

Filed Apr. 16, 1979, Ser. No. 30,156
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

263,444

HAND SCRAPER

Robert R. Hayes, Euclid, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,788
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—90

263,445

CUTTING BLADE HOLDER FOR USE IN THE GRAPHIC ARTS OR THE LIKE

Myron K. Gordin, and Jim L. Drost, both of Oskaloosa, Iowa, assignors to G & L Industries, Inc., Oskaloosa, Iowa

Filed Nov. 15, 1979, Ser. No. 94,374
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—107

263,446
HINGE PIN
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Jan. 14, 1980, Ser. No. 111,884
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323

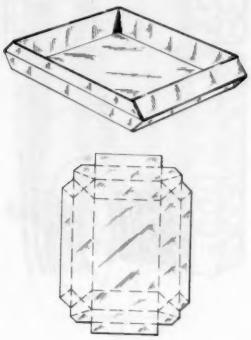
263,447
PACKAGE OF FILTERS
James E. Brown, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Jan. 15, 1980, Ser. No. 113,027
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—352

263,448
BOTTLE
Guy Turcotte, Ville St-Laurent, Canada, assignor to Lavo Ltee/Ltd., Montreal, Canada
Filed Jan. 11, 1980, Ser. No. 111,336
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

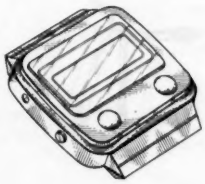
263,449
PACKAGE OF THERMOMETER SHEATHS
Harry S. V. Järund, Lund, Sweden, assignor to Astra-Meditec AB, Gothenburg, Sweden
Filed Sep. 25, 1978, Ser. No. 945,779
Claims priority, application Sweden, Apr. 7, 1978, 78959
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

263,450
COMBINED CARTON AND LID
Daniel P. Dutcher, Woodbury, and David J. Adamek, Minneapolis, both of Minn., assignors to Champion International Corporation, Stamford, Conn.
Filed Aug. 27, 1979, Ser. No. 69,753
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—430

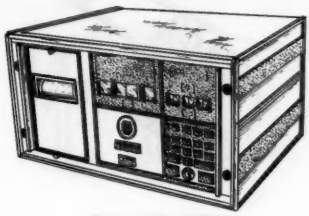
263,451
TRAY WITH HANDLE
Karl R. Persson, Halmstad, Sweden, assignor to Sprinter System AB, Sweden
Filed Jan. 22, 1980, Ser. No. 114,283
Claims priority, application Sweden, Jul. 27, 1979, 791722
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



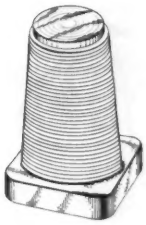
263,452
WRIST WATCH
Masao Wada, Chofu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1980, Ser. No. 128,487
Claims priority, application Japan, Oct. 22, 1979, 44-37579
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



263,453
SIGNAL RECEIVER FOR MONITORING AN ALARM SYSTEM
Menashe Teitelbaum, Brooklyn, and Philip Kolman, Monsey, both of N.Y., assignors to Varitech Security Systems, Inc., New York, N.Y.
Filed Jan. 28, 1980, Ser. No. 115,697
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—104



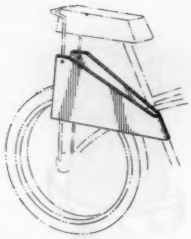
263,454
TRAFFIC BOLLARD
Chung S. Leung, Kowloon, Hong Kong, assignor to Foster Industries Co., Limited, Kowloon, Hong Kong
Filed Oct. 1, 1979, Ser. No. 81,076
Claims priority, application United Kingdom, Jul. 17, 1979, 990752
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



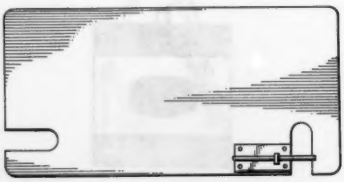
263,455
FINGERPRINT MEDALLION
Edward D. C. Grubbs, 110 Klementina Dr., Pittsburgh, Pa. 15212
Filed Aug. 9, 1979, Ser. No. 65,272
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—104

263,456
SHOPPING CART WITH CHILD SEAT
James M. Muellner, White Bear Lake, Minn., assignor to Smarte Carte, Inc., White Bear Lake, Minn.
Filed May 4, 1979, Ser. No. 36,213
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—18

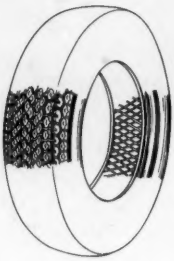
263,457
PENANT FOR A BICYCLE
Robert J. Janning, Jr., 260 N. Mathilda Ave., Apt. H1, Sunnyvale, Calif. 94086
Filed Aug. 27, 1979, Ser. No. 69,612
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



263,458
WHEEL CHAIR TRAY
Jane E. Milizia, 324 N. Winooski Ave., Burlington, Vt. 05401
Filed Aug. 13, 1979, Ser. No. 66,291
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—133

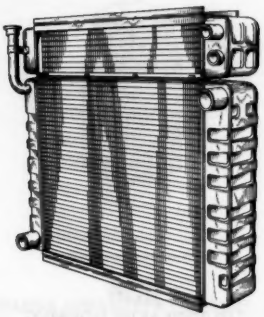


263,459
VEHICLE TIRE
Halvard Nilsson, Gislaved, and Kent-Ove Holmen, Smalandsstenar, both of Sweden, assignors to Gislaved Aktiebolag, Gislaved, Sweden
Filed Nov. 13, 1979, Ser. No. 93,169
Claims priority, application Sweden, May 11, 1979, 79001202
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



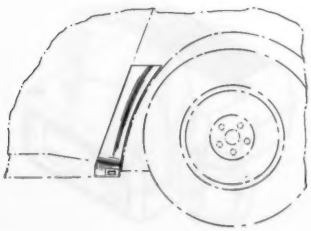
263,460
COMBINED TIRE CHAIN APPLICATOR AND TENSIONER
Kant F. Leach, 4395 S. Galapago St., Englewood, Colo. 80110
Filed Sep. 4, 1979, Ser. No. 72,138
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—154

263,461
COMBINED WATER AND LUBRICATING OIL COOLING RADIATOR
Fred M. Young, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.
Filed Dec. 6, 1978, Ser. No. 966,958
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—166

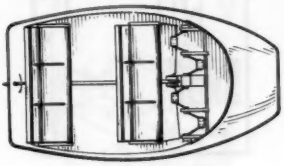


263,462
AIR DAM FOR AUTOMOTIVE VEHICLES
Maurice P. Pare, Farmington, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.
Filed Jun. 29, 1979, Ser. No. 53,227
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

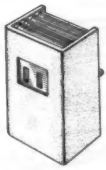
263,463
STONE GUARD FOR AUTOMOBILE FENDER
Donald M. Durben, Rte. 3, Fond du Lac, Wis. 54935
Filed May 3, 1979, Ser. No. 35,778
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—190



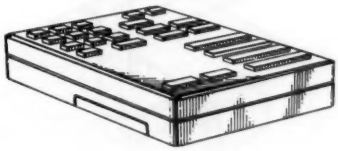
263,464
BOAT
John M. S. Walker, Clough House, Upper Greetland, Halifax, Yorkshire, England
Filed Feb. 12, 1979, Ser. No. 11,688
Claims priority, application United Kingdom, Aug. 11, 1978, 985892
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—306



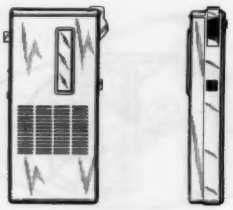
263,465
VOLTAGE CONVERTER OR SIMILAR ARTICLE
Saul S. Fathi, Huntington, N.Y., assignor to Franzus Company, Inc., New York, N.Y.
Filed Oct. 11, 1979, Ser. No. 83,805
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



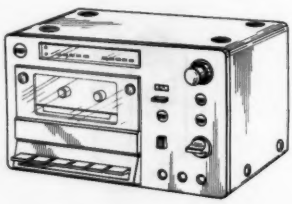
263,466
REMOTE CONTROLLER FOR A VIDEO DISC PLAYER
Takayuki Hiraki, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 11, 1980, Ser. No. 111,396
Claims priority, application Japan, Jul. 11, 1979, 54-28862
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1



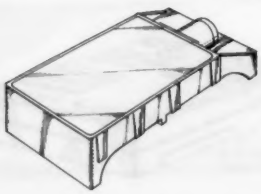
263,467
TAPE RECORDING MACHINE
Arthur J. Pulos, Fayetteville, and Michael Cridland, Manlius, both of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Apr. 20, 1979, Ser. No. 31,918
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3



263,468
CASSETTE TAPE DECK
Shigeki Masatsugu; Tatsuo Katsuhara, and Isao Aburatani, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 19, 1979, Ser. No. 86,680
Claims priority, application Japan, Apr. 20, 1979, 54-15871
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



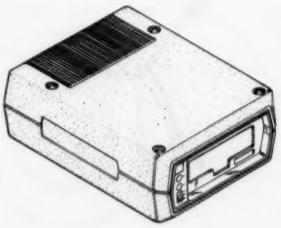
263,469
MAGNETIC DISC MEMORY HOUSING
Geoffrey M. Lee, Los Gatos, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jun. 1, 1979, Ser. No. 44,709
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



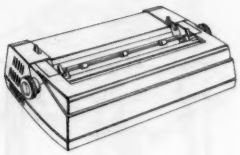
263,470
LOUDSPEAKER HOUSING
Gilbert L. Hobrough, and Theodore B. Hobrough, both of P.O. Box 35369, Vancouver 13, B.C., Canada
Filed Jan. 22, 1980, Ser. No. 114,301
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

263,471
LOUDSPEAKER HOUSING
Gilbert L. Hobrough, and Theodore B. Hobrough, both of P.O. Box 35369, Vancouver 13, B.C., Canada
Filed Jan. 22, 1980, Ser. No. 114,302
Term of patent 14 years
Int. Cl. D14—*01*; D6—*04*
U.S. Cl. D14—33

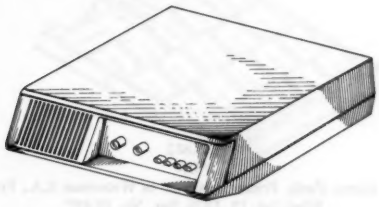
263,472
FLOPPY DISK HOUSING
Roy Nishi, and Russ Farnell, both of San Jose, Calif., assignors to Atari, Inc., Sunnyvale, Calif.
Filed Mar. 22, 1979, Ser. No. 22,570
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109



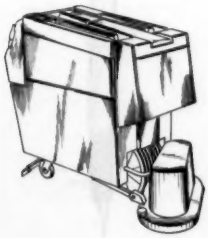
263,473
PRINTER
Masanori Hashimoto, Tokyo, Japan, assignor to Ricoh Company Ltd., Japan
Filed Dec. 13, 1979, Ser. No. 103,225
Claims priority, application Japan, Jun. 20, 1979, 54-95689
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D14—111



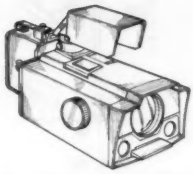
263,474
TWO-WAY RADIO APPARATUS OR SIMILAR ARTICLE
Masaru Tokiyama, Arlington, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 14, 1978, Ser. No. 942,250
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



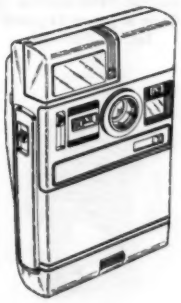
263,475
SCRUBBER
Thomas S. Block, Muskegon, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Nov. 13, 1979, Ser. No. 93,581
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D32—16



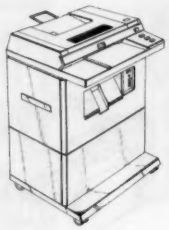
263,476
STILL CAMERA
Yu Sasaki, Funabashi, Japan, assignor to Mamiya Koki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 18, 1979, Ser. No. 49,475
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



263,477
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
Diane B. Ainslie, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 2, 1979, Ser. No. 26,153
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6



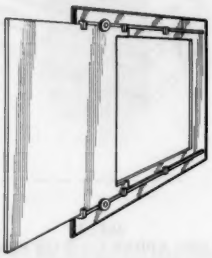
263,478
FACSIMILE MACHINE
Manzo Yoshihama, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan
Filed May 21, 1979, Ser. No. 41,251
Claims priority, application Japan, Nov. 21, 1978, 53-49417
Term of patent 7 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



263,479
RESILIENT CLIP FOR RETAINING REMOVABLE LENSES IN AN EYEGLASS FRAME
Gerrit A. Van Exel, Fullerton, and Claus O. Huckenbeck, Westlake Village, both of Calif., assignors to Bausch & Lomb, Incorporated, Rochester, N.Y.
Filed Nov. 30, 1979, Ser. No. 98,832
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—126

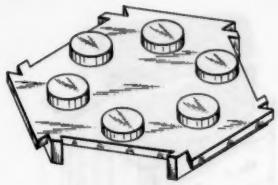
263,480
COMBINED GUIRO AND SHAKER
Martin B. Cohen, Hillsdale, N.J., assignor to Latin Percussion, Inc., Garfield, N.J.
Filed Feb. 28, 1979, Ser. No. 18,093
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

263,481
PICTURE PLANE GRID VIEWER
Philip L. Vest, 1454 Lonsdale Rd., Columbus, Ohio 43227
Filed May 24, 1979, Ser. No. 42,102
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35

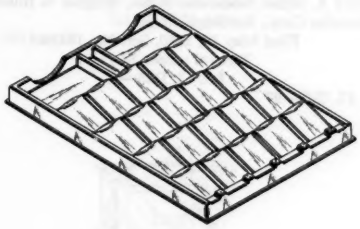


263,482
PEN
Alain Carre, Paris, France, assignor to Waterman S.A., France
Filed Jul. 18, 1979, Ser. No. 58,497
Claims priority, application France, Mar. 6, 1979, 79 77375
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

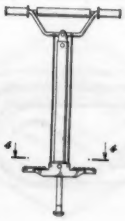
263,483
INTERLOCKING GAME PIECE
Yi Chen, 23356 Batey Ave., Harbor City, Calif. 90710
Filed Jan. 21, 1980, Ser. No. 113,519
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—51



263,484
CARD HOLDER
Yi Chen, 23356 Batey Ave., Harbor City, Calif. 90710
Filed Jan. 21, 1980, Ser. No. 113,520
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—54

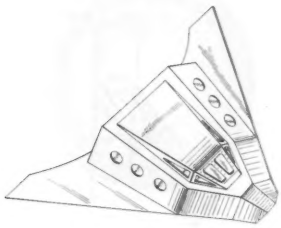


263,485
POGO STICK
Elliot Rudell, 1921 Artesia Blvd., Redondo Beach, Calif. 90278; Joseph Cernansky, and Harold Garner, both of Los Angeles County, Calif., assignors to Elliot Rudell, Lawndale, Calif.
Filed Sep. 14, 1979, Ser. No. 75,848
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—67



263,486
KITE OR SIMILAR ARTICLE
Scott R. Henderson, 905 St. Paul, Ste. 210, Richardson, Tex. 75080
Filed Apr. 30, 1979, Ser. No. 34,269
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88

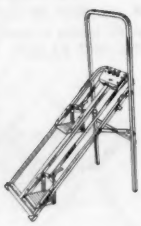
263,487
SIMULATIVE PLAYHOUSE OR SIMILAR ARTICLE
Michael R. LaCrone, 532 Via Pacheco, San Lorenzo, Calif. 94580, and Richard Hamilton, 503 Harris Rd., Hayward, Calif. 94547
Filed May 16, 1979, Ser. No. 39,696
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—115



263,488
ROBOT OR SIMILAR ARTICLE
Frederick Haber, Box 90A, Old Chatham, N.Y. 12136
Filed Apr. 16, 1980, Ser. No. 140,850
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

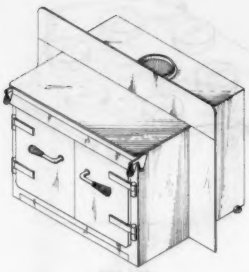
263,489
DOLL
Karen L. Anderson, 24 Dell La., Wantagh, N.Y. 11793
Filed Feb. 4, 1980, Ser. No. 118,438
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

263,490
EXERCISE MACHINE
Ronald P. Hickman, Jersey, Channel Islands, assignor to Tekron Licensing B.V., De Leersum, Netherlands
Filed Dec. 5, 1979, Ser. No. 100,467
Claims priority, application United Kingdom, Jun. 5, 1979, 990,195
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—192

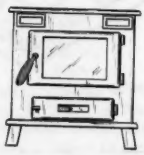


263,491
SOCCER BALL
Stuart S. Surridge, Witham, England, assignor to The Football League Limited, Lytham St. Annes, England
Filed Jul. 24, 1979, Ser. No. 60,206
Claims priority, application United Kingdom, Feb. 28, 1979, 988760
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—205

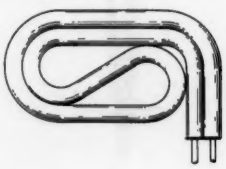
263,492
WOOD BURNING STOVE
Ronnie B. Schaafsma, 31226 172nd Ave. SE., Auburn, Wash. 98002
Filed Sep. 20, 1979, Ser. No. 77,083
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93



263,493
COAL BURNING STOVE
Richard A. Russo, Holbrook, Mass., assignor to Russo Manufacturing Corp., Randolph, Mass.
Filed May 14, 1980, Ser. No. 149,661
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



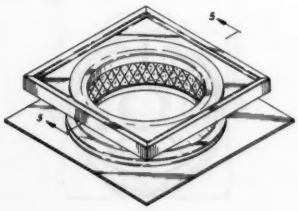
263,494
ELECTRIC HEATING ELEMENT
Randall T. Markum, and Yogesh P. Patel, both of Murfreesboro, Tenn., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 2, 1977, Ser. No. 847,727
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



263,495
FRONT PANEL FOR AN AIR CONDITIONING UNIT
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 3, 1979, Ser. No. 63,624
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—141

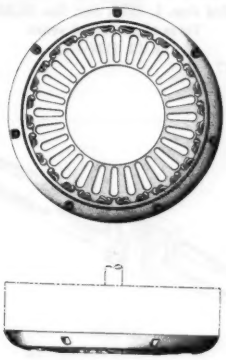
263,496
FILTER
Philip C. Kimball, Andover, and Julian S. Natanson, Lexington, both of Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England
Filed Sep. 24, 1979, Ser. No. 78,099
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149

263,497
ROOF CURB FOR SUPPORTING A VENTILATOR
Ralph M. Kearney, III, Yardley, Pa., assignor to Ralph Kearney & Son, Inc., Cornwells Heights, Pa.
Filed Aug. 2, 1979, Ser. No. 63,348
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

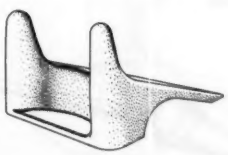


263,498
CEILING FAN BLADE CONNECTOR
Richard Markowitz, 11111 Biscayne Blvd., Miami, Fla. 33161
Filed May 28, 1980, Ser. No. 153,957
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

263,499
CEILING FAN COVER PLATE
Richard Markowitz, 11111 Biscayne Blvd., Miami, Fla. 33161
Filed May 28, 1980, Ser. No. 153,958
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

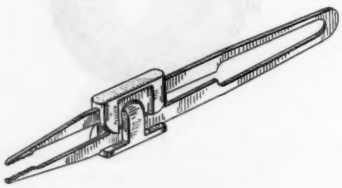


263,500
PORTABLE EXAMINATION TABLE
Albert B. Janko, and Patricia L. Womble, both of 971 Pacific St., Monterey, Calif. 93940
Filed Oct. 10, 1979, Ser. No. 83,254
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—3



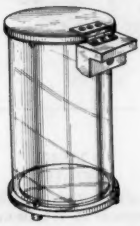
263,501
FOOT SUPPORT FOR A STIRRUP
Nora K. Junk, 44-287 Kaneohe Bay Dr., Kaneohe, Hi. 96744
Filed Jan. 7, 1980, Ser. No. 110,199
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—7

263,502
FORCEPS OR SIMILAR ARTICLE
John A. Tartaglia, 108 Stoddard Rd., Waterbury, Conn. 06708
Filed Jun. 1, 1979, Ser. No. 44,524
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



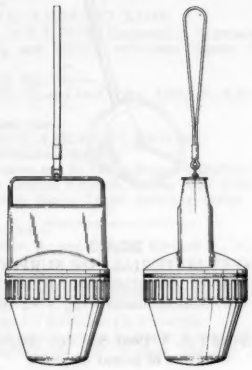
263,503
TAMPON APPLICATOR
Ralph I. Williams, Mendham, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.
Filed May 17, 1979, Ser. No. 39,719
Term of patent 14 years
Int. Cl. D24—*99*; D28—*01*
U.S. Cl. D24—99

263,504
VACUUM CHAMBER FOR THE TRANSFER OF PARENTERAL LIQUIDS
Thomas A. Fowles, McHenry, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jul. 6, 1979, Ser. No. 55,218
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—99

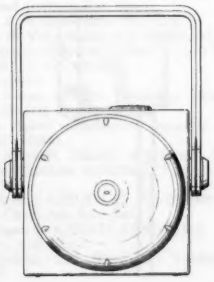


263,505
DISPENSER FOR SURGICAL SUTURES
Seymour Black, West Hartford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Oct. 1, 1979, Ser. No. 80,835
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

263,506
STROBELIGHT
Ming K. Chan, 58 Pau Chung St., Tokwawan, Kowloon, Hong Kong
Filed Apr. 23, 1979, Ser. No. 32,139
Claims priority, application United Kingdom, Nov. 3, 1978, 987,109/79
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—41

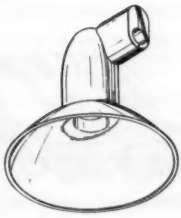


263,507
LANTERN
Chung-Chee Wong, Kowloon, Hong Kong, assignor to Sonca Industries Limited, Kowloon, Hong Kong
Filed Nov. 13, 1979, Ser. No. 94,312
Claims priority, application United Kingdom, Sep. 4, 1979, 991,414/79
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—44



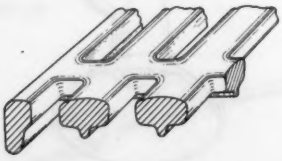
263,508
PORTABLE ELECTRIC TORCH
Louis H. Hubachek, 24524 Cypress Ave., Lomita, Calif. 90717
Filed Sep. 7, 1979, Ser. No. 73,256
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—47

263,509
SPOTLIGHT FITTING
Robert Heritage, 12 Jay Mews, Kensington Gore, London SW7 2EP, and Stephen Hall, 30 Crawford St., London W.1, both of England
Filed Jun. 14, 1979, Ser. No. 48,675
Claims priority, application United Kingdom, Jan. 25, 1979, 988,249/79
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63

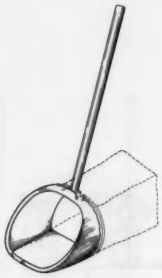


263,510
MINIATURE VICTORIAN CHANDELIER
Norman Nelson, Southington, Conn., assignor to Nelson Tool and Machine Company, Incorporated, Southington, Conn.
Filed Nov. 30, 1979, Ser. No. 98,945
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—81

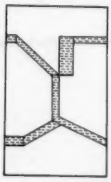
263,511
FLOOR PANEL FOR A PIG SHED
Franz Bartscher, Geseke, Fed. Rep. of Germany, assignor to Josef Schonlau Maschinenfabrik-und Eidengiesserei, Fed. Rep. of Germany
Filed Nov. 1, 1979, Ser. No. 90,099
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



263,512
LITTER SCOOP AND SACKER
Dora T. Kawada, 28,285 Trailriders Dr., Rancho Palos Verdes, Calif. 90274
Filed Feb. 13, 1980, Ser. No. 121,124
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



263,513
PLASTIC SHEET MATERIAL FOR SURFACING A WALL PANEL OR SIMILAR ARTICLE
Joseph Pota, 1727 Massachusetts Ave., NW., Washington, D.C. 20036
Filed Feb. 5, 1980, Ser. No. 106,945
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 V



263,514
COMBINATION MAILBOX, NEWSPAPER RECEPTACLE, AND SUPPORT THEREFOR
Vincent Paparella, 9911 Fruitridge, Sparta, Mich. 49345
Filed Feb. 11, 1980, Ser. No. 120,718
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—32

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A P Products Incorporated: *See—*
Gabor, Robert J.; Tengler, John N.; and Braund, Kenneth W., 4,321,588, Cl. 340-381.000.

A/S Hellesens: *See—*
Jensen, Per J. T., 4,321,315, Cl. 429-152.000.

A/S Surgimed: *See—*
Markling, Jorgen, 4,321,226, Cl. 264-139.000.

A-T-O Inc.: *See—*
Mitchell, Hal D., 4,320,537, Cl. 2-2.000.

Aarts, Petrus J. J., to U.S. Philips Corporation. Apparatus for magnetically recording and reading wide-band signals. 4,321,639, Cl. 360-104.000.

Aavid Engineering, Inc.: *See—*
Johnson, Philip A.; and McCarthy, Alfred F., 4,321,423, Cl. 174-16.0HS.

AB Sture Ljungdahl: *See—*
Petersson, Nils E., 4,320,868, Cl. 229-75.000.

AB Svenska Flaktfabriken: *See—*
Widerby, Lennart; and Eriksson, Birger, 4,320,695, Cl. 98-40.00N.

Abadie, Erwin I.; Lawlor, Kenneth A.; and Dick, John O., to United States of America, Navy. Target detecting device. 4,320,703, Cl. 102-214.000.

Abar Corporation: *See—*
Christian, Robert A.; and Cyrway, Edward N., Jr., 4,321,415, Cl. 13-25.000.

Abbott Laboratories: *See—*
Cox, Alvon R.; and Molyneaux, Thomas A., 4,321,183, Cl. 524-423.000.
Genese, Joseph N., 4,320,889, Cl. 251-6.000.

Abbott, Roderick K.; Seneviratne, Padmasiri D.; and Juhasz, Daniel P., to Varco International, Inc. Internal elevator. 4,320,915, Cl. 294-96.000.

Abe, Katsunobu; Kimura, Satoru; and Kamezawa, Norimasa, to Hitachi, Ltd. Nuclear gyromagnetic resonance apparatus. 4,321,538, Cl. 324-318.000.

Abe, Wataru: *See—*
Tada, Hiroshi; Abe, Wataru; Nozu, Toshiro; and Ishikawa, Keizo, 4,320,548, Cl. 14-1.000.

Abell, Irwin R., to Hartwig-Hartoglass, Inc. Glazing fastener for mounting either rigid or flexible storm windows. 4,320,609, Cl. 52-202.000.

ACF Industries, Incorporated: *See—*
Meyer, Danny S.; and Shelton, William S., 4,320,890, Cl. 251-328.000.

Acrison, Incorporated: *See—*
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,320,855, Cl. 222-56.000.

Adamski, Henry S.: *See—*
Whitcomb, Rodney J.; and Adamski, Henry S., 4,321,122, Cl. 204-195.00R.

Adelman, Herbert B., to Crowell Corporation, The. Sheet packaging material. 4,321,297, Cl. 428-238.000.

Adler, Michael S.; and Huber, Paul G., to General Electric Company. Load control and switching circuits and remote/local control systems using such circuits. 4,321,508, Cl. 315-291.000.

Adolph Saurer Limited: *See—*
Zwiener, Rudolf, 4,320,785, Cl. 139-444.000.

Adrian, Klaus: *See—*
Smerz, Otto; Martini, Thomas; Billenstein, Siegfried; and Adrian, Klaus, 4,321,052, Cl. 8-107.000.

AECI Limited: *See—*
Henfrey, Basil; and Hart, Kenneth R., 4,321,227, Cl. 264-167.000.

Affiliated Hatch and Sunroof, Inc.: *See—*
Butler, James P., 4,320,919, Cl. 296-1.00S.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Fortunato, Gerard; Marechal, Robert A.; and Menetrier, Marc G. Y., 4,320,973, Cl. 356-346.000.

Ahagon, Asahiro: *See—*
Ueda, Akio; Akita, Shuichi; Hirakawa, Hiroshi; and Ahagon, Asahiro, 4,321,168, Cl. 524-526.000.

Ahnell, Joseph E. Pulsed voltammetric detection of microorganisms. 4,321,322, Cl. 435-34.000.

Aida, Masaaki; Kobayashi, Takashi; and Saitoh, Hiroshi, to Hitachi, Ltd. Coil winding machine. 4,320,564, Cl. 29-33.00L.

Aikoh Co., Ltd.: *See—*
Takashima, Masaru, 4,321,035, Cl. 432-250.000.

Air Products and Chemicals, Inc.: *See—*
Hvizdos, Leonard J., 4,320,627, Cl. 62-54.000.

Aisan Industry Co., Ltd.: *See—*
Takada, Shigetaka; and Watanabe, Yukihiro, 4,320,730, Cl. 123-440.000.

Aisin Seiki Company, Limited: *See—*
Toyoda, Minoru, 4,320,641, Cl. 70-456.00R.

Aisin Seiki Kabushiki Kaisha: *See—*
Hori, Takanobu; and Yoshida, Motoharu, 4,321,011, Cl. 416-214.00R.

Ajioka, James S., to Hughes Aircraft Company. Broadband group delay waveguide lens. 4,321,604, Cl. 343-753.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Inductor type synchronous motor driving system for minute control of the position and the rotation angle of the motor. 4,321,518, Cl. 318-696.000.

Akatsu, Yoshi: *See—*
Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.

Aketa, Koichi: *See—*
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Akita, Shuichi: *See—*
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Aladdin Industries, Incorporated: *See—*
Stewart, Herbert M.; and La Fevor, Jack W., 4,320,856, Cl. 222-131.000.

Alberino, Louis M.; and Lockwood, Robert J., to Upjohn Company, The. Polyurethane prepared from polyisocyanate blend. 4,321,333, Cl. 521-159.000.

Albert, Richard D. Focusing radiation collimator. 4,321,473, Cl. 250-505.000.

Alberto, Cappelli: *See—*
Aldemaro, Ciaperoni; and Alberto, Cappelli, 4,321,188, Cl. 524-720.000.

Aldemaro, Ciaperoni; and Alberto, Cappelli, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa s.p.a. Process for producing synthetic flame resisting polyamides, flame resisting filaments and fibres and products obtained by using the same. 4,321,188, Cl. 524-720.000.

Alekhin, Stanislav A.: *See—*
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Klimenko, Vladimir I., 4,321,135, Cl. 209-49.000.

Ali, Fadia E., to SmithKline Corporation. Antiallergic imidodisulfamides. 4,321,254, Cl. 424-40.000.

Alihanka, Jukka; Vaahtoranta, Kaarle; and Bjorkqvist, Stig-Eyrik, to Instrumentarium Oy. Apparatus in medicine for the monitoring and or recording of the body movements of a person on a bed, for instance of a patient. 4,320,766, Cl. 128-671.000.

Allard, Bert M.: *See—*
Beall, Gary W.; and Allard, Bert M., 4,321,158, Cl. 252-628.000.

Allard, Joseph R., to Entwistle Company, The. Payoff neutralizer for cabling wire and fiber strands. 4,320,619, Cl. 57-59.000.

Allbert, Barry J.: *See—*
Corner, Michael R.; and Allbert, Barry J., 4,320,790, Cl. 152-209.00R.

Allcock, Harry R.; and Harris, Paul J., to United States of America, Navy. Dialkylated phosphazene oligomers and method of preparation thereof. 4,321,217, Cl. 260-543.0PN.

Allen, Jerry W., to Westinghouse Electric Corp. Apparatus for measuring dynamic magnetostriction using accelerometers. 4,321,535, Cl. 324-209.000.

Allen Organ Company: *See—*
Whitefield, John T., 4,320,683, Cl. 84-115.000.

Allen, Robert W. Solar energy system and solar collector therefor. 4,320,743, Cl. 126-432.000.

Allenbach, Udo: *See—*
Buttner, Gerhard; Christmann, Karl-Friedrich; Lenthe, Manfred; and Allenbach, Udo, 4,321,204, Cl. 260-346.220.

Allied Corporation: *See—*
Datta, Amitava; and DeCristofaro, Nicholas J., 4,321,090, Cl. 75-123.00B.
Oxenrider, Bruce C.; and Mares, Frank, 4,321,403, Cl. 560-87.000.

Allison, George M., III, to Phillips Petroleum Company. Foundry refractory binder. 4,321,186, Cl. 523-139.000.

Alside, Inc.: *See—*
Kaufman, Donald L., 4,320,613, Cl. 52-521.000.

Altilio, Daniel: *See—*
DiMarzio, Lawrence P.; and Altilio, Daniel, 4,320,829, Cl. 206-45.150.

Altilio, Michael, to DiMarzio Musical Instrument Pickups, Inc. Electromagnetic pickup device. 4,320,681, Cl. 84-1.150.

Altpeter, Arno: *See—*
Mayer, Siegfried; and Altpeter, Arno, 4,320,984, Cl. 403-292.000

Alvord, Robert J.; Beaumont, Gregory J.; and Steinmetz, Richard J., to Zenith Radio Corporation. Regulated video display terminal power supply. 4,321,512, Cl. 315-411.000.

Alwani, Dru W.: *See—*
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,321,181, Cl. 524-521.000.

Alza Corporation: *See—*
Eckenhoff, James B.; Geerke, Johan H.; and Landrau, Felix A., 4,320,758, Cl. 128-260.000.
Theeuwes, Felix, 4,320,759, Cl. 128-260.000.

Ambler, Jeffrey, to Gelman Sciences, Inc. Buffer composition and method for the electrophoretic separation of proteins. 4,321,119, Cl. 204-180.00R.

American Cyanamid Company: *See—*
Brown, John J.; and Hardy, Robert A., Jr., 4,321,379, Cl. 546-16.000.
Cesark, Frank F., 4,321,207, Cl. 260-391.000.
Granzow, Albrecht H., 4,321,187, Cl. 524-133.000.
Miller, Eugene L., 4,321,178, Cl. 524-159.000.
Sheehan, Gerard M.; and Knapp, Donald E., 4,321,152, Cl. 252-1.000.
Weiss, Martin J., 4,321,405, Cl. 560-121.000.

American District Telegraph Company: *See—*
Crandall, Richard E.; Apsell, Sheldon P.; and Galvin, Aaron A., 4,321,592, Cl. 340-541.000.
Galvin, Aaron A.; and Guscott, John K., 4,321,594, Cl. 340-567.000.

American Home Products Corporation: *See—*
Auclair, Claude, 4,321,139, Cl. 210-232.000.
Hon, Edward H., 4,320,764, Cl. 128-635.000.
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,321,384, Cl. 546-123.000.

American Standard Inc.: *See—*
Campbell, Richard D., 4,320,881, Cl. 246-34.00B.

AMF Incorporated: *See—*
Ostreicher, Eugene A., 4,321,288, Cl. 427-244.000.
Vernier, Richard A., 4,321,643, Cl. 361-48.000.

AMP Incorporated: *See—*
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Ampex Corporation: *See—*
Kamath, Bantval Y., 4,321,619, Cl. 358-8.000.
Lemoine, Maurice G., 4,321,704, Cl. 371-51.000.

Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, to Sanofi. 5-o-Cyanobenzyl-4,5,6,7-tetrahydrothieno [3,2-C] pyridine. 4,321,266, Cl. 424-246.000.

Amtel, Inc.: *See—*
Pomonik, George M., 4,320,545, Cl. 441-4.000.

Anderson, Burton C.; and Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Fluorinated phenoxypropyl vinyl ether polymer. 4,321,339, Cl. 525-343.000.

Anderson, Clifford E.: *See—*
Kinley, John C.; Dieckman, Harry E.; and Anderson, Clifford E., 4,320,579, Cl. 33-178.00R.

Anderson, Howard W.; and Levin, Ronald H., to International Business Machines Corporation. Disazo photoconductor and process of manufacture of electrophotographic element. 4,321,318, Cl. 430-59.000.

Andreoni, Allesandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.

Andrew, Edward; and Bello, Gerard. Vehicle for ice and snow. 4,320,905, Cl. 280-12.00H.

Andrulitis, William B.: *See—*
Kurth, William T.; and Andrulitis, William B., 4,321,417, Cl. 136-246.000.

Anic S.p.A.: *See—*
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Salvatori, Tito, 4,321,190, Cl. 524-252.000.

Antipov, Viktor P.: *See—*
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

Antoniotti, Pierre; Matge, Alain; and Guillon, Philippe, to Thomson-CSF. Cartridge for a video-disk, and video-disk suitable for such a cartridge. 4,320,833, Cl. 206-309.000.

Aoki, Harumi; Miyata, Katsuhiko; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,320,946, Cl. 354-25.000.

Aoki, Katashi. Injection blow molder for duplex hollow molded articles. 4,321,029, Cl. 425-523.000.

Aoki, Kiyoshi: *See—*
Tsuji, Shoichi; Aoki, Kiyoshi; and Asai, Minoru, 4,321,233, Cl. 422-142.000.

Apsell, Sheldon P.: *See—*
Crandall, Richard E.; Apsell, Sheldon P.; and Galvin, Aaron A., 4,321,592, Cl. 340-541.000.

Aquarian Accessories Corporation: *See—*
Donohoe, David G., 4,320,688, Cl. 84-422.00S.

Arcari, Guiliana: *See—*
Mantegani, Sergio; Arcari, Guiliana; Caravaggi, Anna M.; and Bosisio, Germano, 4,321,381, Cl. 546-67.000.

Ardin, Dennis B.: *See—*
Simmonds, Charles W.; and Ardin, Dennis B., 4,321,529, Cl. 324-83.00R.

Argo, Dorothy P.; and Sanders, Anne A. Scrubbing method and apparatus using vibrating terry cloth. 4,321,095, Cl. 134-6.000.

Argus Chemical Corp.: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,321,191, Cl. 524-285.000.

Arimoto, Shunji; Shoji, Akio; Takezawa, Shoichiro; Ishikawa, Noboru; and Takeda, Hirofumi, to Dainippon Ink & Chemicals, Inc. Powder coating resin composition. 4,321,335, Cl. 525-116.000.

Arkans, Edward J.; and Villari, Frank K., to Kendall Company, The. Compression device with improved pressure control. 4,320,746, Cl. 128-24.00R.

Arquie, Louis; and Bricot, Claude, to Thomson-CSF. Device for displacing the reading head of a video disc in radial and vertical directions. 4,321,701, Cl. 369-45.000.

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Bernhardt, Karl-Heinz, 4,320,653, Cl. 73-40.000.

Artman, Noel G. Process of fuel stratification within and venting of engine auxiliary combustion chamber. 4,320,727, Cl. 123-290.000.

Artman, Noel G. Engine precombustion chamber with provisions for venting thereof and fuel stratification therein. 4,320,728, Cl. 123-293.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Harumi; Miyata, Katsuhiko; and Sawada, Yoshio, 4,320,946, Cl. 354-25.000.

Asai, Minoru: *See—*
Tsuji, Shoichi; Aoki, Kiyoshi; and Asai, Minoru, 4,321,233, Cl. 422-142.000.

Ashby, Bruce A., to General Electric Company. Ultraviolet light absorbing agents and compositions and articles containing same. 4,321,400, Cl. 556-416.000.

Ashland Oil, Inc.: *See—*
Tordoff, William L., 4,320,651, Cl. 73-15.600.

Asnes, Olav: *See—*
Ellingsen, Olav; and Asnes, Olav, 4,320,908, Cl. 280-604.000.

Asnes Skifabrikk A/S: *See—*
Ellingsen, Olav; and Asnes, Olav, 4,320,908, Cl. 280-604.000.

Associated Octel Company Limited, The: *See—*
Stirling, William; and Peres, Robert L., 4,320,775, Cl. 137-3.000.

Atherton, James H.; and Dreisbach, William C., to RCA Corporation. Level shift circuit. 4,321,491, Cl. 307-475.000.

Atlantic Richfield Company: *See—*
Gupta, Vijai P., 4,321,231, Cl. 422-12.000.
Rowley, Paul R., 4,320,717, Cl. 119-4.000.
Uselton, Robert B.; and Pietsch, Joseph A., 4,320,630, Cl. 62-238.600.
Yoo, Jin S., 4,321,128, Cl. 208-114.000.

Atoji, Hitomi: *See—*
Shimooka, Riyo; Atoji, Hitomi; Yamazaki, Takeshi; and Kunisawa, Masuo, 4,321,620, Cl. 358-75.000.

Atwood, Jerry L., to University of Alabama. Coal liquefaction using liquid clathrates. 4,321,127, Cl. 208-8.0LE.

Auclair, Claude, to American Home Products Corporation. Filtering unit for biological fluids. 4,321,139, Cl. 210-232.000.

Auclair, Claude, to Ayerst, McKenna & Harrison Inc. Method of using gonadorelin for the treatment of benign prostatic hyperplasia. 4,321,260, Cl. 424-177.000.

Audelo, Alexander P., to Select Technology Corporation. Loose parts plating apparatus. 4,321,124, Cl. 204-202.000.

Auskova, Marie: *See—*
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.

Austin Electronics, Inc.: *See—*
Bosnak, John J., 4,321,507, Cl. 315-241.00R.

Automation System, Inc.: *See—*
Bartlett, Peter G., 4,321,477, Cl. 307-35.000.

Automobiles Peugeot: *See—*
Dore', Jacques P., 4,320,632, Cl. 64-21.000.

Avco Everett Research Laboratory, Inc.: *See—*
Zappa, Oswald L., 4,321,558, Cl. 372-58.000.

Axen, Udo F.; and Sih, John C., to Upjohn Company, The. 2,5-Inter-o-phenylene-3,4-dinor-6,9α-epoxy-6β-PGF_1 compounds. 4,321,370, Cl. 542-426.000.

Axenko, Alexandr A.: *See—*
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P., 4,321,125, Cl. 204-273.000.

Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Labyrinth seals. 4,320,903, Cl. 277-22.000.

Ayerst, McKenna & Harrison Inc.: *See—*
Auclair, Claude, 4,321,260, Cl. 424-177.000.

Babcock & Wilcox Company, The: *See—*
Jabsen, Felix S., 4,321,111, Cl. 376-353.000.

Bacardit, Juan S., to Bendiberica S.A. Hydraulic control valve. 4,320,780, Cl. 137-625.210.

Bachle, Walter W., to General Signal Corporation. Clamp for grounding and clamping a conduit to a support member. 4,320,882, Cl. 248-70.000.

Bacsik, George J., to Exxon Research & Engineering Co. Thermal conversion of hydrocarbons with low energy air preheater. 4,321,130, Cl. 208-130.000.

Bahl, Chander P.: *See—*
Wu, Ray J.; Bahl, Chander P.; and Narang, Saran A., 4,321,365, Cl. 536-27.000.

Baier, Anton: *See*—
Pinck, Peter; Heitmann, Uwe; Baier, Anton; and Helms, Adolf, 4,320,773, Cl. 131-281.000.

Baker, Fraser L.; and Baumann, John H. Tissue culture device. 4,321,330, Cl. 435-301.000.

Baker International Corporation: *See*—
Brooks, Robert T., 4,320,804, Cl. 166-339.000.

Baker, Leslie R.; and Reisem, Daniel E., to Minnesota Mining and Manufacturing Co. Low voltage transformer relay. 4,321,652, Cl. 361-209.000.

Bakhir, Vitold M.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Klimenko, Vladimir I., 4,321,135, Cl. 209-49.000.

Balachandran, Chardrasegaram, to Lucas Industries Limited. Fuel supply system for diesel engine. 4,320,734, Cl. 123-510.000.

Baldridge, Morris G.; Knox, Lloyd C.; and Sullaway, Bob L., to Halliburton Company. Grout distribution system. 4,320,992, Cl. 405-223.000.

Ballabio, Adriano: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Salvatori, Tito, 4,321,190, Cl. 524-252.000.

Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. Demycinosyltylosin and process for its production. 4,321,361, Cl. 536-17.00R.

Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. De(mycinosyloxy)tylosin and process for its production. 4,321,362, Cl. 536-17.00R.

Banghart, Thomas S. Data retrieval system and method. 4,321,582, Cl. 340-310.00R.

Banner, Charles E.: *See*—
Kramer, Joseph O.; Young, Otto V.; Banner, Charles E.; and Schuster, John D., 4,320,826, Cl. 198-425.000.

Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W. Thickened butadiene-styrene latices. 4,321,181, Cl. 524-521.000.

Barker, Richard M. Steam cleaner. 4,321,219, Cl. 261-18.00B.

Baron, John R.; and Coggan, Robert K., to British Aerospace Public Company, Limited. Analogue to digital converter channels. 4,321,583, Cl. 340-347.0CC.

Bartlett, Peter G., to Automation System, Inc. Energy management apparatus and method. 4,321,477, Cl. 307-35.000.

Bartsch, Adalbert, to Norddeutsche Affinerie Aktiengesellschaft. Method of and apparatus for the cladding of steel sheet or strip with lower melting metals or alloys. 4,321,289, Cl. 427-287.000.

BASF Aktiengesellschaft: *See*—
Boehm, Georg; and Hillenbrand, Engelbert, 4,321,088, Cl. 75-59.000.
Eicken, Karl; Rohr, Wolfgang; and Linhart, Friedrich, 4,321,395, Cl. 548-253.000.
Hansen, Guenter; Kermer, Wolf-Dieter; and Kolbinger, Hans J., 4,321,055, Cl. 8-639.000.
Neuberg, Rainer; Matthies, Hans G.; and Druschke, Wolfgang, 4,321,341, Cl. 525-437.000.
Parg, Adolf; Wuerzer, Bruno; and Hamprecht, Gerhard, 4,321,371, Cl. 544-92.000.
Radtke, Volker, 4,321,390, Cl. 548-109.000.
Schoch, Werner; Kroener, Michael; and Widder, Rudi, 4,321,412, Cl. 568-436.000.

BASF Wyandotte Corporation: *See*—
Davis, John E.; and Cenker, Moses, 4,321,342, Cl. 525-530.000.
Schmolka, Irving R., 4,321,167, Cl. 252-548.000.

Bass, Wayne E. Positionable toy/bottle holder. 4,320,883, Cl. 248-104.000.

Batinovich, Victor A., to National Semiconductor Corporation. Apparatus for attachment of die to heat sink. 4,320,865, Cl. 228-6.00A.

Batt, Colin B.; Daffern, David; and Gupta, Paramanda, to Canada Printing Ink. News ink. 4,321,094, Cl. 106-32.000.

Battelle Memorial Institute: *See*—
Raymond, Lawrence P., 4,320,594, Cl. 47-1.400.

Batting, Robert D.: *See*—
Stoehr, Steven M.; Hannula, Fred W.; Dumaine, Thomas J.; Batting, Robert D.; and Smithern, Earl D., 4,321,027, Cl. 425-216.000.

Bauck, Uwe: *See*—
Golz, Hans-Joachim; and Bauck, Uwe, 4,321,542, Cl. 324-426.000.

Bauer, Fritz. Position compensation mechanism for a movie camera. 4,320,942, Cl. 352-242.000.

Bauernfeind, Olaf: *See*—
Jochmann, Franz; Fischer, Helmut; Dietz, Wolfgang; and Bauernfeind, Olaf, 4,321,579, Cl. 340-52.00F.

Baumann, Dieter: *See*—
Zuppinger, Paul; and Baumann, Dieter, 4,321,351, Cl. 528-91.000.

Baumann, Hans D. Minute flow regulating valve. 4,320,778, Cl. 137-454.600.

Baumann, John H.: *See*—
Baker, Fraser L.; and Baumann, John H., 4,321,330, Cl. 435-301.000.

Baxter Travenol Laboratories, Inc.: *See*—
Martin, Jerry D.; Ward, Gary A.; and Winchell, David A., 4,320,789, Cl. 150-0.500.

Bayer Aktiengesellschaft: *See*—
Buttner, Gerhard; Christmann, Karl-Friedrich; Lenthe, Manfred; and Allenbach, Udo, 4,321,204, Cl. 260-346.220.
Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,321,408, Cl. 560-192.000.
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,321,336, Cl. 525-183.000.
Panek, Peter; Woditsch, Peter; and Kannchen, Werner, 4,321,237, Cl. 423-82.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,321,394, Cl. 548-234.000.
Schmidt, Adolf; and Clarenz, Werner, 4,321,175, Cl. 524-555.000.
Wilms, Klaus G.; and Waldmann, Helmut, 4,321,143, Cl. 210-631.000.
Zabrocki, Karl; Dhein, Rolf; Weider, Franz; Hohne, Klaus; and Schorn, Kurt, 4,321,170, Cl. 524-285.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Jochmann, Franz; Fischer, Helmut; Dietz, Wolfgang; and Bauernfeind, Olaf, 4,321,579, Cl. 340-52.00F.
Obernberger, Klaus, 4,320,798, Cl. 165-36.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
MacNab, Robert B., 4,321,494, Cl. 310-179.000.

BCG, Ltd.: *See*—
Braver, Sanford L., 4,320,838, Cl. 206-564.000.

Beach, David L.; and Zambelli, Adolfo, to Gulf Research & Development Co. Process for the polymerization of olefins. 4,321,347, Cl. 526-151.000.

Beall, Gary W.; and Allard, Bert M., to United States of America, Energy. Backfill composition for secondary barriers in nuclear waste repositories. 4,321,158, Cl. 252-628.000.

Beasley, Robin D.; and Lewis, Edward L., to Elliott Brothers (London) Limited. Fibre-optic communication systems. 4,321,707, Cl. 455-606.000.

Beatty, Morgan L. Suspension of microencapsulated bacampicillin acid addition salt for oral, especially pediatric, administration. 4,321,253, Cl. 424-35.000.

Beaumont, Gregory J.: *See*—
Alvord, Robert J.; Beaumont, Gregory J.; and Steinmetz, Richard J., 4,321,512, Cl. 315-411.000.

Bechdolt, Robert W., to Fairchild Camera and Instrument Corporation. Transistor logic output for reduced power consumption and increased speed during low to high transition. 4,321,490, Cl. 307-456.000.

Bechthold, Horst, to FA. Maschinenfabrik Buckau R. Wolf AG. Process for the purging of flue gases containing acidic components. 4,321,241, Cl. 423-242.000.

Beckman Instruments, Inc.: *See*—
Gurske, William A., 4,321,121, Cl. 204-180.00G.

Becton, Dickinson and Company: *See*—
Eichhorn, Edward C.; Nugent, Edward L.; and Megahed, Shenoda S., 4,320,769, Cl. 128-763.000.

Bede Industries, Inc.: *See*—
Bede, James D., 4,321,070, Cl. 55-274.000.

Bede, James D., to Bede Industries, Inc. Whistle to signal clogged air filter. 4,321,070, Cl. 55-274.000.

Beecham Group Limited: *See*—
McDonald, Brian G., 4,321,271, Cl. 424-267.000.

Beermann, Ewald H., to Martor-Argentax E. H. Beermann KG, Firma. Razor knife with self-retracting blade. 4,320,576, Cl. 30-162.000.

Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., to Mitel Corporation. Trunk circuit with single coupling transformer. 4,321,431, Cl. 179-18.0AH.

Bell Telephone Laboratories, Incorporated: *See*—
Gunnersen, Carl E.; and Mathis, Terry D., 4,320,938, Cl. 350-96.210.
Johnson, Leo F., 4,321,282, Cl. 427-38.000.
Joyal, Francis G.; and Ren, Chung-Li, 4,321,568, Cl. 333-209.000.

Bello, Gerard: *See*—
Andrew, Edward; and Bello, Gerard, 4,320,905, Cl. 280-12.00H.

Beloit Corporation: *See*—
Goddard, Denis A.; and Dennis, Louis E., Jr., 4,321,108, Cl. 162-272.000.
Page, Robert E., 4,321,107, Cl. 162-198.000.

Bendiberica S.A.: *See*—
Bacardit, Juan S., 4,320,780, Cl. 137-625.210.

Bendix Corporation, The: *See*—
Tasar, Omur; Whiteside, Arliss E.; and Freedman, Morris D., 4,321,666, Cl. 364-200.000.

Bendler, Hellmut: *See*—
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, 4,320,704, Cl. 102-218.000.

Beneke, Wolfgang; and Kluttermann, Jurgen, to Trutzschler GmbH & Co. KG. Drive for a plurality of rotary carding components. 4,320,560, Cl. 19-98.000.

Benitez, Osiel H., to Reynolds Metals Company. Ink system. 4,321,185, Cl. 524-363.000.

Benjamin, Benjamin C., to Schmelzer Corporation. Adjustment for carburetor control devices. 4,320,693, Cl. 92-13.600.

Bentov, Itzhak E. Dilator. 4,320,762, Cl. 128-343.000.

Beresford, Michael P.; and Braun, Willy. Polyester resin granules and process. 4,321,332, Cl. 523-502.000.

Berger, Herbert: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,321,194, Cl. 260-239.00E.

Berger, Jean L.; Coutures, Jean L.; and Descure, Pierre, to Thomson-CSF. Electric charge injection and reading device and application of such a device. 4,321,566, Cl. 333-165.000.

Bergey, James L.: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,321,384, Cl. 546-123.000.

Bergwerksverband GmbH: *See*—
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.

Bernhardt, Karl-Heinz, to Arthur Pfeiffer-Vakuumtechnik Wetzlar GmbH. Method of and apparatus for measuring the rate of leak. 4,320,653, Cl. 73-40.000.

Bernier, Raymond. Sealed electomagnetic relay. 4,321,569, Cl. 335-128.000.

Berri, Rino: *See*—
Mouret, Pierre; Lyaudet, Georges; Sialino, Angelo; and Berri, Rino, 4,321,235, Cl. 423-7.000.

Bertrand, John; Flink, Joseph H.; Shamah, Daniel; and Hosking, Rodger H., to Wavetek Rockland Inc. Spectrum analyzer with frequency band selection. 4,321,680, Cl. 364-485.000.

Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking process employing catalyst having combination of antimony and tin. 4,321,129, Cl. 208-120.000.

Beta Engineering & Development Ltd.: *See*—
Simon, Avi, 4,320,914, Cl. 294-88.000.

Bettenhausen, Merle M. Automobile rear baggage container. 4,320,862, Cl. 224-42.03A.

Betz, Carl R.: *See*—
Drexler, Jerome; and Betz, Carl R., 4,321,102, Cl. 156-246.000.

Bhalla, Ranbir S., to Westinghouse Electric Corp. HID Lamp electrode comprising barium-calcium niobate or tantalate. 4,321,503, Cl. 313-211.000.

Bhitiyakul, Somsak; and Spector, George. Fiber optics laryngoscope. 4,320,745, Cl. 128-11.000.

BICC Limited: *See*—
Rogers, Edward C.; and Edwards, Derek R., 4,321,422, Cl. 174-15.00C.

Bicker, Uwe: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,321,194, Cl. 260-239.00E.

Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I. Method of thermal treatment of a carbonate suspension. 4,321,239, Cl. 423-175.000.

Billenstein, Siegfried: *See*—
Smerz, Otto; Martini, Thomas; Billenstein, Siegfried; and Adrian, Klaus, 4,321,052, Cl. 8-107.000.

Bindernagel, Ali; Bios, Ernst O.; and Brauer, Hans, to Kocks Technik GmbH & Co. Wire or wire rod coolers. 4,320,646, Cl. 72-201.000.

Binks, Chester J., to Solar-Kist Corporation. Flexible separable, non-stick liners for heated cooking surfaces. 4,320,699, Cl. 99-349.000.

Biohumus, Inc.: *See*—
Starr, Jerry, 4,321,142, Cl. 210-610.000.

Biomelktechnik Swiss Hoefelmayr & Co.: *See*—
Hoefelmayr, Tilmann; and Maier, Jakob, 4,320,718, Cl. 119-14.470.

Bise, Tomokazu, to Oki Electric Industry Co., Ltd. Field controlled high value resistor with guard band. 4,321,616, Cl. 357-51.000.

Bithell, Roger M., to Tegal Corporation. Package and sterilizing process for same. 4,321,232, Cl. 422-23.000.

Bitter, Istvan: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Bitter, Istvan; Horvath, Agnes; and Vasvari nee Debreczy, Lelle, 4,321,377, Cl. 544-282.000.

Bittlingmaier, Alfred: *See*—
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., 4,320,620, Cl. 59-93.000.

BJ-Hughes Inc.: *See*—
Manderscheid, Phillip H., 4,320,803, Cl. 166-334.000.

Bjorkqvist, Stig-Eyrik: *See*—
Alihanka, Jukka; Vaahtoranta, Kaarle; and Bjorkqvist, Stig-Eyrik, 4,320,766, Cl. 128-671.000.

Black, Jerimiah B. Modular windmill installation. 4,321,005, Cl. 415-4.000.

Blackburne, Robin M. Rackets. 4,320,900, Cl. 273-73.00D.

Blackman, Maurice V.; and Jenner, Michael D., to U.S. Philips Corporation. Manufacture of an infra-red detector element, and detection elements so manufactured. 4,321,615, Cl. 357-30.000.

Blair, George R., to Hughes Aircraft Company. Method and apparatus for forming metal coating on glass fiber. 4,321,073, Cl. 65-3.310.

Blakeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., to Union Carbide Corporation. Method for extruding linear polyolefin materials having high viscosities. 4,321,229, Cl. 264-349.000.

Blaser, Anton J. Removable lamp housing for optical encoder. 4,321,600, Cl. 340-870.290.

Blaser, Eugene M., to International Business Machines Corporation. Field effect transistor multivibrator. 4,321,484, Cl. 307-273.000.

Blawert, Dieter: *See*—
Knothe, Erich; and Blawert, Dieter, 4,320,809, Cl. 177-243.000.

Bleil, Carl E.; and Epton, Paul J., to General Motors Corporation. Laser line of light generator. 4,321,551, Cl. 330-4.300.

Bloch, Alexander: *See*—
Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, 4,321,366, Cl. 536-55.000.

Blomgvist, Harald, to Oy Wiik & Hoglund AB. Method of manufacturing shrinkable sleeves from a cross-linking plastics material. 4,321,292, Cl. 428-36.000.

Blos, Ernst O.: *See*—
Bindernagel, Ali; Blos, Ernst O.; and Brauer, Hans, 4,320,646, Cl. 72-201.000.

Blount, David H. Process for the production of organic alkali metal silicate compounds. 4,321,184, Cl. 524-3.000.

Blount, David H. Production of carbohydrates. 4,321,360, Cl. 536-1.000.

Blumle, Martin, to Winkler & Dunnebier; and Maschinenfabrik & Eisengiesserei GmbH & Co. Transport apparatus for transporting flexible sheet-like articles. 4,320,893, Cl. 271-94.000.

Bluzer, Nathan; Lampe, Donald R.; and Kub, Francis J., to Westinghouse Electric Corp. Radiant energy sensor with blooming control. 4,321,614, Cl. 357-30.000.

BMS Roasting Equipment Corporation: *See*—
Stachowicz, Edward, 4,320,700, Cl. 99-421.0HV.

Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, to Research Corporation. Process of preparing 2-azido-2-deoxyarabinofuranosyl halides. 4,321,366, Cl. 536-55.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Use of branched ketones in augmenting or enhancing the aroma or taste of foodstuffs, chewing gums, toothpastes or chewing tobacco. 4,321,255, Cl. 424-49.000.

Bodenseewerk Geratetechnik GmbH: *See*—
Krogmann, Uwe, 4,321,678, Cl. 364-453.000.

Boehm, Georg; and Hillenbrand, Engelbert, to BASF Aktiengesellschaft. Process for treating pig iron melts and steel melts or alloys. 4,321,088, Cl. 75-59.000.

Boehringer Mannheim GmbH: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,321,194, Cl. 260-239.00E.

Boeing Company, The: *See*—
Brasfield, Robert G., 4,321,644, Cl. 361-56.000.

Bohn & Dawson: *See*—
Knoche, Raymond E., 4,320,818, Cl. 188-2.00F.

Bohrdt, Joaquin: *See*—
Grieger, Gerhard; and Bohrdt, Joaquin, 4,321,435, Cl. 200-82.00B.

Boitano, Robert A.: *See*—
Engle, Charles J.; and Boitano, Robert A., 4,320,896, Cl. 273-1.50R.

Boler, Clifford H.; and Wilwerding, Dennis J., to Honeywell Inc. Photodetector signal control in charge transfer device imager. 4,321,486, Cl. 307-311.000.

Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,321,082, Cl. 71-90.000.

Bommart, Patrick, to C. Delachaux. Devices for adjusting two butt ends of rails to be connected by welding. 4,320,708, Cl. 104-112.000.

Bonkowski, Richard L.: *See*—
Morozowich, Merle; and Bonkowski, Richard L., 4,321,485, Cl. 307-300.000.

Borel, Robert J.: *See*—
Meldahl, Robert D.; and Borel, Robert J., 4,320,822, Cl. 192-18.00R.

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Mlot-Fijalkowski, Adolf; and Borrows, Kenneth P., 4,321,534, Cl. 324-216.000.

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Bosisio, Germano: *See*—
Mantegani, Sergio; Arcari, Guiliana; Caravaggi, Anna M.; and Bosisio, Germano, 4,321,381, Cl. 546-67.000.

Bosnak, John J., to Austin Electronics, Inc. Strobe power supply. 4,321,507, Cl. 315-241.00R.

Bosso, Joseph F.: *See*—
Castellucci, Nicholas T.; and Bosso, Joseph F., 4,321,305, Cl. 428-418.000.

Boulanger, Philippe; Kaplan, Daniel; and Mourier, Georges, to Thomson-CSF. Ultra-high frequency device for depositing thin films on solids. 4,320,716, Cl. 118-723.000.

Bourgoin, Bernard, to Centre Technique des Industries Mecaniques. Sprinkling device for grinding wheels. 4,320,600, Cl. 51-267.000.

Bouvet, Jean M.; and Quemerais, Philippe, to Regie Nationale des Usines Renault; and Renault Vehicules. Three-way electrically-actuated hydraulic distributor. 4,320,781, Cl. 137-625.650.

Bouvrande, Andre M., to Societe de Telecommunications Electronique Aeronetique et Maritime "TEAM". Dash-board with removable inscriptions. 4,321,655, Cl. 362-29.000.

Bowden, William L.; and Moses, Peter R., to Duracell International Inc. Non-aqueous cell safety. 4,321,314, Cl. 429-50.000.

Bowes, Stephen M., Jr., to Florida Machine & Foundry Co. Dredge cutterhead tooth. 4,320,925, Cl. 299-90.000.

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Boyd, Walter A.: *See*—
Lindstrom, John W.; Boyd, Walter A.; and Del Rosso, Victor, 4,321,103, Cl. 156-351.000.

Boyer, Robert C.; Williams, George; and Wessner, Herbert A., to Ecolaire Incorporated. Method of retrofitting a heat exchanger. 4,320,566, Cl. 29-157.400.

Boyle, Alan: *See*—
Gordon, Hilton P.; Richards, Arthur W.; Hawkins, Albert P.; and Boyle, Alan, 4,320,841, Cl. 209-552.000.

Brackmann, Horst: *See*—
Kleefeldt, Frank; and Brackmann, Horst, 4,320,639, Cl. 70-364.00R.

Bradley, John J.: *See*—
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.
Bradshaw, James E.: *See*—
Lynnworth, Lawrence C.; Seger, John L.; and Bradshaw, James E., 4,320,659, Cl. 73-589.000.
Bragole, Robert A.; and Weidman, Richard A., to USM Corporation. Laminate including polymeric body adhesively bonded to irradiated coating of paint. 4,321,307, Cl. 428-423.100.
Braschos, Karl-Heinz. Device for culling articles such as package units identified as defective. 4,320,840, Cl. 209-523.000.
Brasfield, Robert G., to Boeing Company, The. Power line transient limiter. 4,321,644, Cl. 361-56.000.
Brauer, Hans: *See*—
Bindernagel, Ali; Blos, Ernst O.; and Brauer, Hans, 4,320,646, Cl. 72-201.000.
Braun, Edward L.; and Thomson, Eric A. Financial data processing system. 4,321,672, Cl. 364-408.000.
Braun, Paul E.; Lopiccola, Joseph F.; and Freismuth, Richard J., to Ford Motor Company. Carburetor air bleed control system. 4,320,731, Cl. 123-440.000.
Braun, Willy: *See*—
Beresford, Michael P.; and Braun, Willy, 4,321,332, Cl. 523-502.000.
Braund, Kenneth W.: *See*—
Gabor, Robert J.; Tengler, John N.; and Braund, Kenneth W., 4,321,588, Cl. 340-381.000.
Braver, Sanford L., to BCG, Ltd. Calculator tray apparatus. 4,320,838, Cl. 206-564.000.
Brede, Uwe: *See*—
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, 4,320,704, Cl. 102-218.000.
Breitschwerdt, Alfred: *See*—
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Bremmer, Bart J.: *See*—
Vrieland, G. Edwin; Bremmer, Bart J.; and Crooks, Richard E., 4,321,389, Cl. 546-345.000.
Brennan, Thomas F.: *See*—
Schaeffer, Friedrich K.; and Brennan, Thomas F., 4,321,426, Cl. 174-34.000.
Breslow, Jeffrey D.: *See*—
Morrison, Howard J.; Breslow, Jeffrey D.; and Harper, Rex M., 4,320,901, Cl. 273-237.000.
Bresnahan, David P.: *See*—
Roy, Pradip K.; Feldbrugge, Alonzo H. R.; and Bresnahan, David P., 4,321,280, Cl. 426-276.000.
Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., to Dow Chemical Company, The. Organo titanium chromium compound, catalyst prepared therefrom and polymerization of olefins therewith. 4,321,159, Cl. 252-429.00B.
Brezosky, Bernard J., to General Electric Company. Panel assembly for sheet metal panels having double wall construction corners. 4,320,614, Cl. 52-630.000.
Brice, Henri; Puff, Roger M.; and Kita, Jean-Claude, to Charbonnages de France. Process for the treatment of combustible granular and/or pulverulent material by drying and/or heating, and an installation for carrying out the process. 4,321,032, Cl. 432-14.000.
Brichard, Jean; and Colery, Jean-Claude, to Interox. Process for stabilizing particles of peroxygenated compounds. 4,321,301, Cl. 428-403.000.
Bricot, Claude: *See*—
Arquie, Louis; and Bricot, Claude, 4,321,701, Cl. 369-45.000.
Briese, Leonard A. Coolant guide for end mill. 4,320,999, Cl. 409-136.000.
Brissey, David C.: *See*—
Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., 4,320,605, Cl. 52-94.000.
British Aerospace Public Company, Limited: *See*—
Baron, John R.; and Coggan, Robert K., 4,321,583, Cl. 340-347.0CC.
British Gas Corporation: *See*—
Pickard, Gordon W.; and Hayward, Ian, 4,321,547, Cl. 328-133.000.
Brooks, Robert T., to Baker International Corporation. Subsea test tree. 4,320,804, Cl. 166-339.000.
Broutman, Lawrence J. Process for continuous production of thermosetting resinous fibers. 4,321,221, Cl. 264-23.000.
Brower, Boyd G.; and Shaffer, John W., to GTE Products Corporation. Die-stamped circuit board assembly having relief means-method of making. 4,320,572, Cl. 29-832.000.
Brown, Albert E.: *See*—
Scott, Michael A.; and Brown, Albert E., 4,321,286, Cl. 427-152.000.
Brown, John J.; and Hardy, Robert A., Jr., to American Cyanamid Company. 4-Aryl-1-oxa-8-azaspiro[4,5]dec-3-en-2-ones. 4,321,379, Cl. 546-16.000.
Brown, Leon C.; and Pond, Stanley L., to International Business Machines Corp. Corona wire adjuster. 4,320,957, Cl. 355-3.0CH.
Brown, Malcolm P.: *See*—
Flint, Leslie; and Brown, Malcolm P., 4,320,755, Cl. 128-205.120.
Brown, William J.; and Rowley, James R., to PPG Industries, Inc. Flat glass shipping rack. 4,320,836, Cl. 206-451.000.
Brownell, David A. Decorative butterfly and method of construction. 4,321,291, Cl. 428-16.000.
Brunelle, Daniel J., to General Electric Company. Transesterification process utilizing as a reactant bis(ortho-haloaryl)carbonates. 4,321,356, Cl. 528-200.000.
Brunst, George E.; Thomas, Francis E.; and Wanner, Walter W., to General Electric Company. Composite panel member for use in a bowling lane. 4,320,898, Cl. 273-51.000.
Bryant, Floyd C.; and Smith, James R. Combination drill and screwdriver. 4,320,544, Cl. 7-158.000.
Bucher, Bernard P.: *See*—
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,321,378, Cl. 544-321.000.
Buckles, Richard G. Method for quantitative analysis using optical fibers. 4,321,057, Cl. 23-230.00B.
Buels, Jesse H. Bi-directional wind power generator. 4,321,476, Cl. 290-55.000.
Bunting, James R.: *See*—
Dowben, Robert M.; and Bunting, James R., 4,320,970, Cl. 356-317.000.
Burba, John L., III, to Dow Chemical Company, The. Lithium aluminates for gas chromatograph columns. 4,321,065, Cl. 55-67.000.
Burkhard, Lorenz; and Fas, Hans, to Luwa AG. Method of and apparatus for the thermal treatment of flowable material. 4,321,106, Cl. 159-49.000.
Burnett, Harvey L. Medicament for arthritic conditions. 4,321,262, Cl. 424-195.000.
Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,321,063, Cl. 44-74.000.
Burns, Lyle D.: *See*—
Parlman, Robert M.; Lee, Roy C.; and Burns, Lyle D., 4,321,061, Cl. 44-63.000.
Burroughs Corporation: *See*—
Panigrahi, Godavarish; and Rege, Satish L., 4,321,694, Cl. 365-77.000.
Burton, Clyde L.: *See*—
Tennes, Bernard R.; Wolthuis, Richard J.; and Burton, Clyde L., 4,320,995, Cl. 406-39.000.
Buschbom, Floyd E.; and Hansen, Glen D., to Veda, Inc. Material conveying apparatus. 4,320,825, Cl. 198-360.000.
Bushman, Donald W., to S. C. Johnson & Son, Inc. Shampoo composition. 4,321,156, Cl. 252-142.000.
Busse, Donald W.: *See*—
Paros, Jerome M.; and Busse, Donald W., 4,321,500, Cl. 310-321.000.
Butler, James P., to Affiliated Hatch and Sunroof, Inc. Aerodynamic visor. 4,320,919, Cl. 296-1.00S.
Buttner, Gerhard; Christmann, Karl-Friedrich; Lenthe, Manfred; and Allenbach, Udo, to Bayer Aktiengesellschaft. Preparation of certain 2-methyl-2,3-dihydro-benzofuran-7-ols. 4,321,204, Cl. 260-346.220.
Buttrill, Sidney E., Jr., to SRI International. Flow discharge ion source. 4,321,467, Cl. 250-288.000.
C & D Distributors, Inc.: *See*—
Piontkowski, Carl F., 4,320,742, Cl. 126-289.000.
C. Delachaux: *See*—
Bommart, Patrick, 4,320,708, Cl. 104-112.000.
Cain, David G., to Electric Power Research Institute, Inc. Method and means for measuring flow of a two phase fluid. 4,320,665, Cl. 73-861.040.
Cairns, Gerald J. W., to Cairns, Howard Ingram, a part interest. Nipple operated animal watering valve. 4,320,891, Cl. 251-332.000.
Cairns, Howard Ingram: *See*—
Cairns, Gerald J. W., 4,320,891, Cl. 251-332.000.
Cajal, Victor A.: *See*—
Hawwass, Ebrahim; Hawwass, Hassan; Nassif, John; Cajal, Victor A.; and Krone, Kenneth T., 4,321,673, Cl. 364-412.000.
Callahan, Phyllis M.; Christian, Emmanuel K.; and Christian, Josiah W. Window perch. 4,320,816, Cl. 182-55.000.
Calspan Corporation: *See*—
Schneider, Clayton J., Jr., 4,321,546, Cl. 324-457.000.
Calundann, Gordon W.: *See*—
Davitt, Robert; Calundann, Gordon W.; and Chenevey, Edward C., 4,321,182, Cl. 524-233.000.
Cama, Lovji D.; Guthikonda, Ravindra; and Christensen, Burton G., to Merck & Co., Inc. 1-Carba-6-(1-hydroxyethyl)-2-carbonyl-penem-3-carboxylic acid and preparation thereof. 4,321,197, Cl. 260-245.2OT.
Cameron, James N. Carbon dioxide measurement system. 4,321,545, Cl. 324-442.000.
Camp, Albert T., to United States of America, Navy. Method of reinforcing propellant charge. 4,321,220, Cl. 264-3.00R.
Campanello, John: *See*—
Miller, Alan; Schweizer, Edward E.; and Campanello, John, 4,321,040, Cl. 433-102.000.
Campbell, James G.: *See*—
Herrod, Clive A.; and Campbell, James G., 4,320,568, Cl. 29-421.00R.
Campbell, Richard D., to American Standard Inc. Fail-safe decoder for digital track circuits. 4,320,881, Cl. 246-34.00B.
Canada Printing Ink: *See*—
Batt, Colin B.; Daffern, David; and Gupta, Paramanda, 4,321,094, Cl. 106-32.000.
Canon Denshi Kabushiki Kaisha: *See*—
Senuma, Michio; Sugiura, Yoji; and Shimada, Fumio, 4,320,950, Cl. 354-235.000.
Canon Kabushiki Kaisha: *See*—
Hosoe, Kazuya; Tsunekawa, Tokuichi; Masunaga, Makoto; and Sakane, Toshio, 4,320,948, Cl. 354-31.000.

Ishida, Masato; Maeshima, Katsuyoshi; and Sakamaki, Hisashi, 4,320,964, Cl. 355-69.000.
Kawai, Tohru, 4,320,951, Cl. 354-286.000.
Komine, Yoshio, 4,320,947, Cl. 354-25.000.
Morikawa, Teruo; and Murata, Shinji, 4,320,959, Cl. 355-11.000.
Sado, Ichiro; and Matsuyama, Shigeru, 4,321,688, Cl. 364-900.000.
Sawamura, Mitsuharu, 4,320,936, Cl. 350-1.600.
Senuma, Michio; Sugiura, Yoji; and Shimada, Fumio, 4,320,950, Cl. 354-235.000.
Takahashi, Tohru; and Tamura, Yasuyuki, 4,320,962, Cl. 355-14.00C.

Canup, Robert E., to Texaco, Inc. High-frequency continuous-wave ignition system. 4,320,735, Cl. 123-606.000.

Cappa, Giulio: *See—*
Tangorra, Giorgio; and Cappa, Giulio, 4,321,049, Cl. 474-242.000.

Caravaggi, Anna M.: *See—*
Mantegani, Sergio; Arcari, Guiliana; Caravaggi, Anna M.; and Bosisio, Germano, 4,321,381, Cl. 546-67.000.

Card-O-Matic Pty. Limited: *See—*
Stanley, Louis, 4,320,645, Cl. 72-132.000.

Carl Freudenberg, Firma: *See—*
Schuhmacher, Gunter; Freudenberg, Bertram; and Muhlfeld, Horst, 4,321,173, Cl. 525-453.000.

Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., to Scientific Applications Incorporated. Insulation panel. 4,320,605, Cl. 52-94.000.

Carlson, Lee G. Ion exchange treatment for removing toxic metals and cyanide values from waste waters. 4,321,145, Cl. 210-678.000.

Carlson, Richard O., to General Electric Company. Integral humidity sensor/heater configurations. 4,321,577, Cl. 338-35.000.

Carr, Charles W.; and Forster, Kevin G., to Caterpillar Tractor Co. Hydraulic manifold assembly. 4,320,694, Cl. 92-161.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Nesting and stacking container. 4,320,837, Cl. 206-505.000.

Carroll, Paul E.: *See—*
Harris, Ralph A.; and Carroll, Paul E., 4,321,675, Cl. 364-421.000.

Carus Chemical Company: *See—*
Robinson, Eric, 4,321,240, Cl. 423-210.000.

Castellucci, Nicholas T., to PPG Industries, Inc. Beta-diketone-epoxy resin reaction products blended with monomeric or polymeric phosphonium salts useful for providing corrosion resistance. 4,321,304, Cl. 428-418.000.

Castellucci, Nicholas T.; and Bosso, Joseph F., to PPG Industries, Inc. Beta-diketone-epoxy resin reaction products useful for providing corrosion resistance. 4,321,305, Cl. 428-418.000.

Castle, Alfred B. Lifting tool. 4,321,003, Cl. 414-440.000.

Caterpillar Tractor Co.: *See—*
Carr, Charles W.; and Forster, Kevin G., 4,320,694, Cl. 92-161.000.
Evans, William P.; and Kline, Jan C., 4,321,469, Cl. 250-358.00R.
Manna, Albert, 4,320,813, Cl. 180-249.000.
McWilliams, Orcenith D., 4,320,691, Cl. 91-437.000.
Neal, James G.; and Stafford, Warren J., 4,320,783, Cl. 138-110.000.

Cathignol, Dominique; Fourcade, Claude; and Chapelon, Jean-Yves, to Institut National de la Sante et de la Recherche Medicale - I.N.-S.E.R.M. Doppler pseudorandom noise velocimeters. 4,320,765, Cl. 128-663.000.

Cato Research Corporation: *See—*
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,321,089, Cl. 75-84.500.

Cavitt, Stanley B., to Texaco Development Corporation. Ethylene oxide production. 4,321,206, Cl. 260-348.340.

Celanese Corporation: *See—*
Davitt, Robert; Calundann, Gordon W.; and Chenevey, Edward C., 4,321,182, Cl. 524-233.000.

Cenker, Moses: *See—*
Davis, John E.; and Cenker, Moses, 4,321,342, Cl. 525-530.000.

Centre Technique des Industries Mecaniques: *See—*
Bourgoin, Berrard, 4,320,600, Cl. 51-267.000.

Cerberus AG: *See—*
Tresch, Erwin, 4,321,595, Cl. 340-630.000.

Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, to SPOFA, United Pharmaceutical Works. Alkyl cyanomethyl ergoline-I derivatives and salts thereof, and methods for their preparation. 4,321,380, Cl. 546-67.000.

Cesark, Frank F., to American Cyanamid Company. Process for preparing triarylmethane dyes. 4,321,207, Cl. 260-391.000.

Ceserani, Roberto: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.

Cespon, Manuel, to Kores Holding Zug AG. Pressure-sensitive duplicating material. 4,321,092, Cl. 106-21.000.

Champion International Corporation: *See—*
Roccaforte, Harry I., 4,320,830, Cl. 206-45.190.

Chan, Ka-Kong; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Fluorinated aromatic polyenes. 4,321,209, Cl. 260-408.000.

Chapelon, Jean-Yves: *See—*
Cathignol, Dominique; Fourcade, Claude; and Chapelon, Jean-Yves, 4,320,765, Cl. 128-663.000.

Charbonnages de France: *See—*
Brice, Henri; Puff, Roger M.; and Kita, Jean-Claude, 4,321,032, Cl. 432-14.000.

Charles, Robert T. Paint roller assembly. 4,320,553, Cl. 15-230.110.

Chatterjee, Ananda M., to Shell Oil Company. Melt crystallization of butene-1 polymers. 4,321,334, Cl. 524-579.000.

Chavdarian, Charles G.; and Sanders, Edward B., to Philip Morris, Incorporated. Process for the preparation of optically active nicotine analogs. 4,321,387, Cl. 546-281.000.

Chemische Werke Huls AG: *See—*
Coenen, Alfred; Kosswig, Kurt; Praun, Ferdinand v.; and Regner, Hans, 4,321,247, Cl. 423-424.000.

Chen, Li F.; Gong, Cheng S.; and Tsao, George T., to Purdue Research Foundation. Preparation of spherical shaped mycelial pellets. 4,321,327, Cl. 435-161.000.

Chenevey, Edward C.: *See—*
Davitt, Robert; Calundann, Gordon W.; and Chenevey, Edward C., 4,321,182, Cl. 524-233.000.

Cheng, Paul J., to Phillips Petroleum Company. Method for vortex flow carbon black production. 4,321,248, Cl. 423-456.000.

Cheng, Wen-Jiu; and Luoma, Ernie V., to Dow Chemical Company, The. Method for the preparation of cross-linked polysaccharide ethers. 4,321,367, Cl. 536-88.000.

Cheng, Yung-Chi: *See—*
Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, 4,321,366, Cl. 536-55.000.

Chevron Research Company: *See—*
Magee, Philip S., 4,321,080, Cl. 71-67.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Bitter, Istvan; Horvath, Agnes; and Vasvari nee Debreczy, Lelle, 4,321,377, Cl. 544-282.000.

Chisso Corporation: *See—*
Sato, Akihiro; Tachibana, Masami; and Kikuta, Kazutsune, 4,321,345, Cl. 526-115.000.

Chonez, Michel A.: *See—*
de la Cruz, Pantaleon S.; and Chonez, Michel A., 4,320,680, Cl. 83-870.000.

Christensen, Burton G.: *See—*
Cama, Lovji D.; Guthikonda, Ravindra; and Christensen, Burton G., 4,321,197, Cl. 260-245.20T.

Christian, Emmanuel K.: *See—*
Callahan, Phyllis M.; Christian, Emmanuel K.; and Christian, Josiah W., 4,320,816, Cl. 182-55.000.

Christian, Josiah W.: *See—*
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Christian, Robert A.; and Cyrway, Edward N., Jr., to Abar Corporation. Heating element support for vacuum electric furnaces. 4,321,415, Cl. 13-25.000.

Christmann, Karl-Friedrich: *See—*
Buttner, Gerhard; Christmann, Karl-Friedrich; Lenthe, Manfred; and Allenbach, Udo, 4,321,204, Cl. 260-346.220.

Chromalloy American Corporation: *See—*
Hillmann, Kermit C.; and Holsapple, Tom H., 4,320,810, Cl. 180-6.300.

Chrosticai Sidirou Co., Ltd.: *See—*
Gavogiannis, Panayotis, 4,321,249, Cl. 423-632.000.

Chszaniecki, Siegfried, to Hermann Berstorff Maschinenbau GmbH. Drive means for a twin screw extruder. 4,320,928, Cl. 308-207.00R.

Ciba-Geigy Corporation: *See—*
Ehrenfreund, Josef; and Roloff, Achim, 4,321,276, Cl. 424-322.000.
Felder, Louis; Kirchmayr, Rudolf; and Husler, Rinaldo, 4,321,118, Cl. 204-159.180.
Rasberger, Michael; and Muller, Helmut, 4,321,218, Cl. 260-967.000.
Zuppinger, Paul; and Baumann, Dieter, 4,321,351, Cl. 528-91.000.

Cibie Projecteurs: *See—*
Deverrewaere, Alain, 4,321,658, Cl. 362-292.000.

CKD Praha, oborovy podnik: *See—*
Krtek, Jan, 4,321,663, Cl. 363-137.000.

Clarenz, Werner: *See—*
Schmidt, Adolf; and Clarenz, Werner, 4,321,175, Cl. 524-555.000.

Clark, Wallace; and Goldstein, Albert S., Jr., to Oncor Corporation. Sealed bearing system for hydraulically operated devices. 4,320,929, Cl. 308-230.000.

Clearfield Machine Company: *See—*
Taccone, Charles C., 4,321,034, Cl. 432-105.000.

Clemmesen, Sven O. Building unit for piggeries. 4,320,719, Cl. 119-28.000.

CMI Corporation: *See—*
Rowe, Murray A.; Giesmann, Herbert C.; and Ulmer, Ewald, 4,320,987, Cl. 404-115.000.

Coats, John H.: *See—*
Whaley, Howard A.; and Coats, John H., 4,321,329, Cl. 435-253.000.

Coburn Optical Industries, Inc.: *See—*
Hill, Phillip; and Hunter, Billy D., 4,320,599, Cl. 51-58.000.

Coenen, Alfred; Kosswig, Kurt; Praun, Ferdinand v.; and Regner, Hans, to Chemische Werke Huls AG. Process for preparing sodium bicarbonate and hydrogen chloride. 4,321,247, Cl. 423-424.000.

Coggan, Robert K.: *See—*
Baron, John R.; and Coggan, Robert K., 4,321,583, Cl. 340-347.0CC.

Cohen, Howard. Portable, suspended outdoor shelter. 4,320,542, Cl. 5-121.000.

Cohen, Saul M.; and LeBlanc, John R., to Monsanto Company. Acetals of adducts of acrolein and isocyanuric acid. 4,321,375, Cl. 544-221.000.

Coleman Company, Inc., The: *See—*
Gruver, Floyd O., Jr., 4,321,656, Cl. 362-180.000.

Colery, Jean-Claude: *See—*
Brichard, Jean; and Colery, Jean-Claude, 4,321,301, Cl. 428-403.000.
Collins, Michael H., to Shell Internationale Research Maatchappij. System for detecting cracks in the heat-insulating lining of a container for liquefied gas. 4,320,654, Cl. 73-40.700.
Comber, William R. Setback device. 4,321,458, Cl. 219-511.000.
Combustion Engineering, Inc.: *See—*
Richards, George W., 4,321,132, Cl. 208-352.000.
Communications Satellite Corporation: *See—*
Horna, Otakar A., 4,321,686, Cl. 364-724.000.
Compagnie Generale de Geophysique: *See—*
Gole, Francois; and Rocroi, Jean-Pierre, 4,321,540, Cl. 324-357.000.
Compagnie Generale des Matieres Nucleaires (COGEMA): *See—*
Mouret, Pierre; Lyaudet, Georges; Sialino, Angelo; and Berri, Rino, 4,321,235, Cl. 423-7.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean-Pierre, 4,321,606, Cl. 346-74.100.
Comparetto, John E. Multi-band or network male contraceptive. 4,320,752, Cl. 128-132.00R.
Compton, Leslie E.: *See—*
Stover, Carole S.; and Compton, Leslie E., 4,321,465, Cl. 250-255.000.
Computer Peripherals, Inc.: *See—*
Fidler, Thomas D.; and Sapino, Anthony P., 4,321,609, Cl. 346-75.000.
Moore, Donn F.; and Folkerts, Michael A., 4,321,610, Cl. 346-108.000.
Conoco Inc.: *See—*
Hunter, Andrew F., 4,320,993, Cl. 405-224.000.
Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,320,866, Cl. 229-37.00R.
Gardner, Jeffrey M., 4,320,867, Cl. 229-42.000.
Skaggs, Boyd T., 4,320,839, Cl. 206-591.000.
Conti, Mario, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Avalanche photodetector for fiber-optical system and method of making same. 4,321,611, Cl. 357-13.000.
Continental Group, Inc., The: *See—*
Drolen, Fred W., Jr., 4,320,850, Cl. 220-269.000.
Contracap, Inc.: *See—*
Loeb, Marvin P., 4,320,751, Cl. 128-127.000.
Coombs, Peter M.: *See—*
Davis, Austin E.; Cormier, Raymond G.; and Coombs, Peter M., 4,320,961, Cl. 355-14.0SH.
Cooper, Michael F. A. Releasable locking system. 4,320,844, Cl. 215-260.000.
Cooper, Michael N.; and Pokalsky, Peter A., to Knogo Corporation. Article theft detection. 4,321,586, Cl. 340-572.000.
Cormier, Raymond G.: *See—*
Davis, Austin E.; Cormier, Raymond G.; and Coombs, Peter M., 4,320,961, Cl. 355-14.0SH.
Corner, Michael R.; and Allbert, Barry J., to Dunlop Limited. Tire treads. 4,320,790, Cl. 152-209.00R.
Corning Glass Works: *See—*
Cunningham, George M., 4,321,025, Cl. 425-131.100.
Messing, Ralph A., 4,321,141, Cl. 210-603.000.
Cornwell, Charles E.; and Plunguian, Mark. Method of producing stabilized aqueous dispersions of silica fume. 4,321,243, Cl. 423-268.000.
Costa, Lawrence C., to Halcon SD Group, Inc., The. Catalytic hydrogenation of glycolaldehyde to produce ethylene glycol. 4,321,414, Cl. 568-862.000.
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Salvatori, Tito, to Anic S.p.A. Polyolefin compositions stabilized against UV light radiations with open-chain hindered amines. 4,321,190, Cl. 524-252.000.
Cottrell, Terence B. F.; and Paddock, Dennis C., to Lodge-Cottrell Ltd. Non-welded discharge electrode. 4,321,068, Cl. 55-148.000.
Courdille, Rene. Apparatus for induction heating of metal products, particularly slabs and blooms. 4,321,449, Cl. 219-10.710.
Couture, William F., to Iowa Beef Processors, Inc. Animal hide conveying method and apparatus. 4,320,559, Cl. 17-50.000.
Coutures, Jean L.: *See—*
Berger, Jean L.; Coutures, Jean L.; and Descure, Pierre, 4,321,566, Cl. 333-165.000.
Covaleski, Stanley F., to Raybestos-Manhattan, Inc. Friction members formed from compositions containing aramid fibers and an aqueous heat-hardenable cement comprising a water soluble phenolic resin and a heat-curable elastomer. 4,320,823, Cl. 192-107.00M.
Cowpland, Michael C. J.: *See—*
Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., 4,321,431, Cl. 179-18.0AH.
Cox, Alvon R.; and Molyneaux, Thomas A., to Abbott Laboratories. Solid golf ball center with block butadiene-styrene polymers. 4,321,183, Cl. 524-423.000.
Cox, Donald M.: *See—*
Maas, Edward T., Jr.; and Cox, Donald M., 4,321,116, Cl. 204-158.00R.
Craft, Kingsley W., to John Fluke Mfg. Co., Inc. Frequency modulated phase-locked loop signal source. 4,321,706, Cl. 375-59.000.
Crandall, Richard E.; Apsell, Sheldon P.; and Galvin, Aaron A., to American District Telegraph Company. Multiple sensor intrusion detection system. 4,321,592, Cl. 340-541.000.
Crawford, Thomas C., to Pfizer Inc. Bis-esters of methanediol with acetonides of ampicillin or amoxicillin and penicillanic acid 1,1-dioxide. 4,321,196, Cl. 260-239.100.
Crean, Peter A., to Xerox Corporation. Scanning apparatus. 4,321,628, Cl. 358-293.000.
Crnkovich, Greg: *See—*
Hilton, Barney W.; Lin, Robert I.; and Crnkovich, Greg, 4,320,658, Cl. 73-437.000.
Crooks, Richard E.: *See—*
Vrieland, G. Edwin; Bremmer, Bart J.; and Crooks, Richard E., 4,321,389, Cl. 546-345.000.
Crossley, Neville S.: *See—*
Bowler, Jean; and Crossley, Neville S., 4,321,275, Cl. 424-317.000.
Crowell Corporation, The: *See—*
Adelman, Herbert B., 4,321,297, Cl. 428-238.000.
Crowley, Helen L. Bridge learning and playing kit. 4,321,045, Cl. 434-129.000.
Crump, John M. Equipment carrying and, or, securing device. 4,320,916, Cl. 294-147.000.
Crump, John M. Equipment carrying and, or, securing device. 4,320,917, Cl. 294-147.000.
Crump, John M. Equipment assembling, carrying and, or, securing device. 4,320,918, Cl. 294-147.000.
Cryer, Edward, to Lucas Industries Ltd. Operating lever assembly for an electrical switch. 4,321,437, Cl. 200-61.540.
CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Conti, Mario, 4,321,611, Cl. 357-13.000.
Cuche, Claude; Jeanneret, Rene; and Niederhauser, Michel, to Edouard Dubied & Cie. Societe Anonyme. Electromagnetic selection device for needles of a knitting machine. 4,320,635, Cl. 66-220.000.
Cueli, Peter: *See—*
Levine, Sol; Kamen, Melvin E.; DeFazio, August; and Cueli, Peter, 4,321,087, Cl. 75-0.50A.
Cummins Engine Company, Inc.: *See—*
Dimitroff, Edward, 4,321,056, Cl. 23-230.0HC.
Cunningham, George M., to Corning Glass Works. Extrusion die. 4,321,025, Cl. 425-131.100.
Curasi, Robert R. Crankshaft counterbalancing. 4,320,671, Cl. 74-604.000.
Cushman, Robert H., to Pennwalt Corporation. Panoramic dental X-ray machine with camera detached therefrom. 4,321,472, Cl. 250-439.00P.
Cyanamid Canada, Inc.: *See—*
Robertson, Allan J., 4,321,213, Cl. 260-502.40R.
Cyrway, Edward N., Jr.: *See—*
Christian, Robert A.; and Cyrway, Edward N., Jr., 4,321,415, Cl. 13-25.000.
Dabroski, Winifred C., to Johnson & Johnson Products, Inc. Water resistant orthopedic cast. 4,320,750, Cl. 128-91.00R.
Daffern, David: *See—*
Batt, Colin B.; Daffern, David; and Gupta, Paramanda, 4,321,094, Cl. 106-32.000.
Dages, Daniel: *See—*
Dran, Maurice; Dages, Daniel; and Le Gravier, Serge, 4,321,418, Cl. 136-251.000.
D'Agnolo, Armando, to Officine Savio S.p.A. Device for continuously relaxing yarns. 4,320,563, Cl. 28-248.000.
Dahl, Klaus: *See—*
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.
Dainippon Ink & Chemicals, Inc.: *See—*
Arimoto, Shunji; Shoji, Akio; Takezawa, Shoichiro; Ishikawa, Noboru; and Takeda, Hirofumi, 4,321,335, Cl. 525-116.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Kimura, Yoshikazu; Tanabe, Kenziro; and Yonehara, Hiroyuki, 4,320,965, Cl. 355-74.000.
Saito, Isao; Hirosawa, Makoto; and Sakamoto, Seiya, 4,321,631, Cl. 358-298.000.
Shimooka, Riyo; Atoji, Hitomi; Yamazaki, Takeshi; and Kunisawa, Masuo, 4,321,620, Cl. 358-75.000.
D'Alelio, Gaetano F.; and Waitkus, Phillip A., to Plastics Engineering Company. Polyimide derivatives having acetylenic amic acid groups. 4,321,198, Cl. 260-326.00S.
Dalferth, Hans H.: *See—*
Puppel, Alfred; and Dalferth, Hans H., 4,320,827, Cl. 198-731.000.
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., 4,320,620, Cl. 59-93.000.
Dandl, John E. Tree shaker attachment for vehicles. 4,320,618, Cl. 56-328.0TS.
Daniel Industries, Inc.: *See—*
Tomlin, Jerry B.; and Strickland, James N., 4,320,777, Cl. 137-315.000.
Daniell, Roy B., Jr. Slidably-coupled joint. 4,320,747, Cl. 128-80.00C.
Daniels, Klaus. Air outlet. 4,320,696, Cl. 98-41.0AV.
Dashwood, Nigel J. R.; and Plummer, Dexter R., to PA Management Consultants Limited. Optical compensators for cinematography. 4,320,941, Cl. 352-111.000.
Data General Corporation: *See—*
Harrison, Michael; and Davis, Wilbern F., 4,320,981, Cl. 400-124.000.
Datta, Amitava; and DeCristofaro, Nicholas J., to Allied Corporation. Magnetic amorphous metal alloys. 4,321,090, Cl. 75-123.00B.
Davies, Evan J. Induction heating apparatus. 4,321,444, Cl. 219-10.410.

Davis, Austin E.; Cormier, Raymond G.; and Coombs, Peter M., to Nashua Corporation. Jam detecting apparatus and method for electrostatic copier. 4,320,961, Cl. 355-14.0SH.
Davis, John E.; and Cenker, Moses, to BASF Wyandotte Corporation. Curable fixtures of polyepoxides and amine-terminated graft polymer dispersions. 4,321,342, Cl. 525-530.000.
Davis, Larry: *See—*
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,321,385, Cl. 546-208.000.
Davis, Ralph A.; and Stauffer, Randy C., to Dow Chemical Company, The. Oxidizing medium for dyes. 4,321,054, Cl. 8-621.000.
Davis, Wilbern F.: *See—*
Harrison, Michael; and Davis, Wilbern F., 4,320,981, Cl. 400-124.000.
Davitt, Robert; Calundann, Gordon W.; and Chenevey, Edward C., to Celanese Corporation. Stable non-corrosive solution of polybenzimidazole suitable for use in the formation of shaped articles. 4,321,182, Cl. 524-233.000.
de la Cruz, Pantaleon S.; and Chonez, Michel A. Fruit cutter. 4,320,680, Cl. 83-870.000.
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M. Process for producing L-threonine. 4,321,325, Cl. 435-115.000.
deBettencourt, Joseph T.: *See—*
Rowland, Howard J.; and deBettencourt, Joseph T., 4,320,801, Cl. 166-248.000.
Deckert, Cheryl A.: *See—*
Valembois, Pierre V.; Deckert, Cheryl A.; and Holub, Edward J., 4,320,567, Cl. 29-407.000.
DeCristofaro, Nicholas J.: *See—*
Datta, Amitava; and DeCristofaro, Nicholas J., 4,321,090, Cl. 75-123.00B.
Deere & Company: *See—*
Kerr, Russell H., 4,321,097, Cl. 148-12.400.
Winter, David C., 4,320,805, Cl. 172-776.000.
DeFazio, August: *See—*
Levine, Sol; Kamen, Melvin E.; DeFazio, August; and Cueli, Peter, 4,321,087, Cl. 75-0.50A.
Deffenbaugh, James F., to Wean United, Inc. Flash welders. 4,321,452, Cl. 219-100.000.
Degawa, Takashi; Suginuma, Atsushi; Usui, Hideo; Kawashima, Kenichi; Kan, Tsuneo; and Takao, Kunihiko, to Hitachi, Ltd. Swash plate type compressor. 4,321,019, Cl. 417-269.000.
Deike, Robert F., to Foresight Industries. Post support socket. 4,320,608, Cl. 52-165.000.
de Kok, Johan, to Wavin B.V. Method of and apparatus for manufacturing a plastic pipe comprising longitudinally extending hollow channels in its wall. 4,321,228, Cl. 264-209.800.
Delalande S.A.: *See—*
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,321,378, Cl. 544-321.000.
Deleris, Robert, to Regie Nationale des Usines Renault. Process and apparatus for adjustment of the angular position of a part in rotational motion. 4,321,580, Cl. 340-870.240.
Delgado, Emil, to Phillips Petroleum Company. Polar-nonpolar solvent system for decoiling hydrocarbon sulfonates. 4,321,216, Cl. 260-504.00S.
Del Rosso, Victor: *See—*
Lindstrom, John W.; Boyd, Walter A.; and Del Rosso, Victor, 4,321,103, Cl. 156-351.000.
De Luca, Paul V.; and Fasano, Michael, to Porta Systems Corp. Telephone circuit sensitive station protector. 4,321,650, Cl. 361-119.000.
Demidovich, Boris K.: *See—*
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.
Dennis, Louis E., Jr.: *See—*
Goddard, Denis A.; and Dennis, Louis E., Jr., 4,321,108, Cl. 162-272.000.
Dennison, William T.; and Jan, David K., to United Technologies Corporation. Outer case cooling for a turbine intermediate case. 4,321,007, Cl. 415-142.000.
Descure, Pierre: *See—*
Berger, Jean L.; Coutures, Jean L.; and Descure, Pierre, 4,321,566, Cl. 333-165.000.
DeSoto, Inc.: *See—*
Lin, Shiow-Ching, 4,321,172, Cl. 524-591.000.
Sekmakas, Kazys; and Shah, Raj, 4,321,176, Cl. 524-555.000.
Destree, Allen L. Tool support for concrete pilings. 4,320,887, Cl. 248-651.000.
Deutsche Gardner-Denver G.m.b.H.: *See—*
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,320,806, Cl. 173-12.000.
Deverrewaere, Alain, to Cibie Projecteurs. Headlamps for vehicles, and light units for such headlamps. 4,321,658, Cl. 362-292.000.
Dhein, Rolf: *See—*
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,321,336, Cl. 525-183.000.
Zabrocki, Karl; Dhein, Rolf; Weider, Franz; Hohne, Klaus; and Schorn, Kurt, 4,321,170, Cl. 524-285.000.
Diagraphix, Inc.: *See—*
Link, William T., 4,320,943, Cl. 353-27.00R.
Dick, John O.: *See—*
Abadie, Erwin I.; Lawlor, Kenneth A.; and Dick, John O., 4,320,703, Cl. 102-214.000.
Dickson, Donald L.; and Dickson, Steven L. Street sweeping machine. 4,320,552, Cl. 15-84.000.
Dickson, Steven L.: *See—*
Dickson, Donald L.; and Dickson, Steven L., 4,320,552, Cl. 15-84.000.
Dieckman, Harry E.: *See—*
Kinley, John C.; Dieckman, Harry E.; and Anderson, Clifford E., 4,320,579, Cl. 33-178.00R.
Diehl GmbH & Co.: *See—*
Meisner, Alfred; and Grasser, Hans, 4,321,697, Cl. 368-187.000.
Dietz, Wolfgang: *See—*
Jochmann, Franz; Fischer, Helmut; Dietz, Wolfgang; and Bauernfeind, Olaf, 4,321,579, Cl. 340-52.00F.
DiGiacomo, Peter M., to Occidental Research Corporation. Sorting of limestone ores using fluorescent compounds. 4,321,133, Cl. 209-3.300.
Digital Equipment Corporation: *See—*
Leis, Michael D.; and Rose, Robert C., 4,321,632, Cl. 360-49.000.
Digital Recording Corporation: *See—*
Russell, James T., 4,321,700, Cl. 369-44.000.
Dilger, Peter: *See—*
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DiMarzio, Lawrence P.; and Altilio, Daniel, to DiMarzio Musical Instrument Pickups, Inc. Merchandise display container. 4,320,829, Cl. 206-45.150.
DiMarzio Musical Instrument Pickups, Inc.: *See—*
Altilio, Michael, 4,320,681, Cl. 84-1.150.
DiMarzio, Lawrence P.; and Altilio, Daniel, 4,320,829, Cl. 206-45.150.
Dimitroff, Edward, to Cummins Engine Company, Inc. Measurement of engine oil consumption. 4,321,056, Cl. 23-230.0HC.
Dixon, Linda H. Medical pillow. 4,320,543, Cl. 5-434.000.
Dobbin, Robert R., to John B. Pike & Son, Inc. Apparatus and method for cleaning an explosion sensing port. 4,321,096, Cl. 134-8.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Wegert, Friedrich, 4,320,673, Cl. 74-865.000.
Dr. Johannes Heidenhain GmbH: *See—*
Ernst, Alfons, 4,320,578, Cl. 33-125.00T.
Documation Incorporated: *See—*
Martin, Joel T., 4,321,597, Cl. 340-724.000.
Doi, Shunichi: *See—*
Nakamura, Tomio; and Doi, Shunichi, 4,321,411, Cl. 564-135.000.
Donaldson, Harris M. Composite bale tie method. 4,320,701, Cl. 100-3.000.
Donnelly, Joseph H., to Fogel Commercial Refrigerator Company. Portable beverage chiller/warmer. 4,320,626, Cl. 62-3.000.
Donohoe, David G., to Aquarian Accessories Corporation. Synthetic drumstick and method of producing same. 4,320,688, Cl. 84-422.00S.
Dore', Jacques P., to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Sliding universal joints notably for automobile vehicle transmissions. 4,320,632, Cl. 64-21.000.
Dorman, Isidore, to NB Jackets Company (a div. of Bell & Howell Co.). Flip-type photo album. 4,320,591, Cl. 40-398.000.
Dorn, Peter: *See—*
Herbstman, Sheldon; and Dorn, Peter, 4,321,062, Cl. 44-71.000.
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., to Delalande S.A. 8-(5-Pyrimidinecarboxamide)nor-tropane derivatives. 4,321,378, Cl. 544-321.000.
Dove, Norman F. Steam distribution apparatus for flat paper sheet. 4,320,583, Cl. 34-54.000.
Dow Chemical Company, The: *See—*
Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., 4,321,159, Cl. 252-429.00B.
Burba, John L., III, 4,321,065, Cl. 55-67.000.
Cheng, Wen-Jiu; and Luoma, Ernie V., 4,321,367, Cl. 536-88.000.
Davis, Ralph A.; and Stauffer, Randy C., 4,321,054, Cl. 8-621.000.
Leasher, Arthur L.; and McLaren, John W., 4,320,910, Cl. 285-45.000.
Reineke, Charles E., 4,321,193, Cl. 260-239.00A.
Vrieland, G. Edwin; Bremmer, Bart J.; and Crooks, Richard E., 4,321,389, Cl. 546-345.000.
Widiger, Alexander H., Jr.; Randall, Osro W., III; and Pulver, Steven M., 4,321,331, Cl. 521-32.000.
Dowben, Robert M.; and Bunting, James R. Photon counting fluorimeter. 4,320,970, Cl. 356-317.000.
Dragerwerk AG: *See—*
Grambow, Lutz; and Kruger, Dieter, 4,321,113, Cl. 204-1.00T.
Dran, Maurice; Dages, Daniel; and Le Gravier, Serge, to Saint Gobain Vitrage. Process for manufacture of solar photocell panels and panels obtained thereby. 4,321,418, Cl. 136-251.000.
Dreisbach, William C.: *See—*
Atherton, James H.; and Dreisbach, William C., 4,321,491, Cl. 307-475.000.
Drews, Ulrich: *See—*
Schnurle, Hans; Drews, Ulrich; and Werner, Peter, 4,320,732, Cl. 123-478.000.
Drexler, Jerome; and Betz, Carl R., to Drexler Technology Corporation. Method for making gelatin epoxy sheet materials. 4,321,102, Cl. 156-246.000.
Drexler Technology Corporation: *See—*
Drexler, Jerome; and Betz, Carl R., 4,321,102, Cl. 156-246.000.

Drogin, Robert: *See—*
Ryu, Ji-Yong; Rao, Krishna K.; Spohn, Ralph J.; and Drogin, Robert, 4,321,402, Cl. 560-24.000.
Drolen, Fred W., Jr., to Continental Group, Inc., The. Easy opening end unit with tapered score. 4,320,850, Cl. 220-269.000.
Drugge, Roland, to Loussavaara-Kiirunavaara Aktiebolag. Method of sintering pellets. 4,321,085, Cl. 75-5.000.
Druschke, Wolfgang: *See—*
Neuberg, Rainer; Matthies, Hans G.; and Druschke, Wolfgang, 4,321,341, Cl. 525-437.000.
Dubach, Werner F. For bottle or the like, comprising tearable tensioning means as warranty. 4,320,843, Cl. 215-256.000.
Dubos, Jacques; Faure, Michel; and Lumineau, Yves, to Lignes Telegraphiques et Telephoniques. Method for automatic centering of an optical fiber within a primary protective cladding and a device employed for carrying out said method. 4,321,072, Cl. 65-3.110.
DuBuske, Stanley, to United States of America, Army. Method of joining boron nitride to a refractory. 4,321,100, Cl. 156-89.000.
Duda, Eugene; Maumy, Alain; and Tondu, Claude, to Thomson-CSF. System for soldering a semiconductor laser to a metal base. 4,321,617, Cl. 357-71.000.
Duderstadt, John C.: *See—*
Stolle, William H.; and Duderstadt, John C., 4,320,547, Cl. 11-1.0AC.
Dugan, John M., to Rockwell International Corporation. Apparatus for deriving clock pulses from return-to-zero data pulses. 4,321,483, Cl. 307-269.000.
Dumaine, Thomas J.: *See—*
Stoehr, Steven M.; Hannula, Fred W.; Dumaine, Thomas J.; Batting, Robert D.; and Smithern, Earl D., 4,321,027, Cl. 425-216.000.
Dunlap, Dorsey S. Non-toxic insecticide. 4,321,258, Cl. 424-84.000.
Dunlop Limited: *See—*
Corner, Michael R.; and Allbert, Barry J., 4,320,790, Cl. 152-209.00R.
Dunphy, Gerald F.; and Newman, Donald J., to Ogden Industries Pty. Limited. Tumbler lock and key. 4,320,638, Cl. 70-358.000.
Duo-Fast Corporation: *See—*
Novak, Raymond F.; and Geist, Bernard W., 4,320,864, Cl. 227-130.000.
Duperret, Jean. Automatic drying installation. 4,320,585, Cl. 34-66.000.
Du Pont de Nemours, E. I., and Company: *See—*
Anderson, Burton C.; and Uschold, Ronald E., 4,321,339, Cl. 525-343.000.
Lawes, Bernard C.; and Watts, John C., 4,320,923, Cl. 299-5.000.
Miller, Lester I., 4,321,169, Cl. 524-428.000.
Romano, Albert P., 4,321,320, Cl. 430-290.000.
Scribner, Richard M., 4,321,201, Cl. 260-326.430.
Smiley, Robert A., 4,321,407, Cl. 560-191.000.
Smith, Malcolm S., 4,321,337, Cl. 525-329.000.
Duracell International Inc.: *See—*
Bowden, William L.; and Moses, Peter R., 4,321,314, Cl. 429-50.000.
Durst AG Fabrik Fototechnischer Apparate: *See—*
Obertegger, Franz, 4,320,976, Cl. 356-418.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Wirtz, Hans, 4,320,596, Cl. 47-66.000.
Dye, Richard G.; and Robichaud, Arthur W. Deep drawn and ironed pressure vessel having selectively controlled side-wall thicknesses. 4,320,848, Cl. 220-72.000.
Dynamit Nobel AG: *See—*
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, 4,320,704, Cl. 102-218.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Nestler, Heinz; and Schnippering, Friedhelm, 4,321,401, Cl. 556-457.000.
E. R. Squibb & Sons, Inc.: *See—*
Ryono, Denis E.; and Ondetti, Miguel A., 4,321,392, Cl. 548-215.000.
Sprague, Peter W., 4,321,383, Cl. 546-113.000.
Sundeen, Joseph E., 4,321,270, Cl. 424-267.000.
Sykes, Richard B.; and Parker, William L., 4,321,326, Cl. 435-121.000.
Eastern Company, The: *See—*
Pastva, John V., Jr., 4,320,642, Cl. 70-472.000.
Eastman Kodak Company: *See—*
Whitcomb, Rodney J.; and Adamski, Henry S., 4,321,122, Cl. 204-195.00R.
Eaton Corporation: *See—*
Piber, Earl T., 4,321,443, Cl. 200-315.000.
Eaton, Jim N. Remote control for neckover trailer hitches. 4,320,907, Cl. 280-511.000.
Eberhardt, Roland C. Blanking press having stripping means. 4,320,676, Cl. 83-146.000.
Eberlein, Dietmar: *See—*
Schultes, Max; and Eberlein, Dietmar, 4,320,953, Cl. 355-3.0SH.
Ebert, Edward A. Flue gas trap and diverter. 4,320,869, Cl. 236-1.00G.
Ebnet, Friedrich: *See—*
Warnest, Albert; and Ebnet, Friedrich, 4,321,573, Cl. 337-78.000.
Eburn, William H., Jr.; and Kalenik, Stephen P., to Polaroid Corporation. Constant flow pumping apparatus. 4,321,014, Cl. 417-5.000.
Eckardt, Robert C.: *See—*
Esterowitz, Leon; and Eckardt, Robert C., 4,321,559, Cl. 372-41.000.
Eckenhoff, James B.; Geerke, Johan H.; and Landrau, Felix A., to Alza Corporation. Osmotically driven fluid dispenser. 4,320,758, Cl. 128-260.000.
Ecolaire Incorporated: *See—*
Boyer, Robert C.; Williams, George; and Wessner, Herbert A., 4,320,566, Cl. 29-157.400.
Eddy, Clifford O.; and Seanor, Donald A., to Xerox Corporation. Thermally conductive fusing device. 4,321,033, Cl. 432-60.000.
Edel, Wilhelm; Heindl, Reinhold; Isenhardt, Friedel; and Schultze-Rhonhof, Ernst, to Klockner-Humboldt-Deutz Ag. Method and device for the burning of an artificial carbon body, especially of an anode for the aluminum fusion electrolysis. 4,321,457, Cl. 219-497.000.
Edgar, Roger F., to Infra-Red Engineering Ltd. Apparatus for measuring a radiation affecting parameter of a film or coating. 4,320,967, Cl. 356-51.000.
Edison, David M.: *See—*
Sackin, Milton; Edison, David M.; and Thompson, Francis T., 4,321,681, Cl. 364-492.000.
Edouard Dubied & Cie. Societe Anonyme: *See—*
Cuche, Claude; Jeanneret, Rene; and Niederhauser, Michel, 4,320,635, Cl. 66-220.000.
Edstrom, Richard. Clip for holding safety razor. 4,320,832, Cl. 206-228.000.
Edwards, Derek R.: *See—*
Rogers, Edward C.; and Edwards, Derek R., 4,321,422, Cl. 174-15.00C.
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., to Hoechst Roussel Pharmaceuticals Inc. [(Aryl-1-pyrryl) methyl]-piperidinols and pyrrolidinols. 4,321,385, Cl. 546-208.000.
Efimov, Vyacheslav T.: *See—*
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P., 4,321,125, Cl. 204-273.000.
Eglowstein, Ira; and Solender, Peter E., to Eglowstein, Ira. System for controlling the delivery of data from a data source. 4,321,689, Cl. 364-900.000.
Eguchi, Tsukasa. Rubber stopper for tight sealing. 4,321,306, Cl. 428-421.000.
Ehlers, Klaus-Peter: *See—*
Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, 4,321,245, Cl. 423-321.00S.
Ehrenfreund, Josef; and Roloff, Achim, to Ciba-Geigy Corporation. Phenylureas. 4,321,276, Cl. 424-322.000.
Eichhorn, Edward C.; Nugent, Edward L.; and Megahed, Shenoda S., to Becton, Dickinson and Company. Universal holder for blood collecting tubes. 4,320,769, Cl. 128-763.000.
Eicken, Karl; Rohr, Wolfgang; and Linhart, Friedrich, to BASF Aktiengesellschaft. Preparation of acetanilides. 4,321,395, Cl. 548-253.000.
Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton; and Kromer, Peter, 4,320,561, Cl. 24-241.0PS.
Ejzak, Richard P.: *See—*
Thom, James B.; and Ejzak, Richard P., 4,321,645, Cl. 361-63.000.
Ekmark, Bo. Method for making roofing. 4,320,648, Cl. 72-301.000.
Elbert, Charles F., to Harvey Hubbell Incorporated. Section insulator with improved arc control. 4,320,820, Cl. 191-39.000.
Elco International: *See—*
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,320,924, Cl. 299-37.000.
Electric Power Research Institute, Inc.: *See—*
Cain, David G., 4,320,665, Cl. 73-861.040.
Peterson, William E.; Thompson, Robert B.; and Vasile, Carmine F., 4,320,661, Cl. 73-643.000.
Eli Lilly and Company: *See—*
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,321,361, Cl. 536-17.00R.
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,321,362, Cl. 536-17.00R.
Ellingsen, Olav; and Asnes, Olav, to Asnes Skifabrikk A/S. Skis. 4,320,908, Cl. 280-604.000.
Elliott Brothers (London) Limited: *See—*
Beasley, Robin D.; and Lewis, Edward L., 4,321,707, Cl. 455-606.000.
Ellis, Edward J.; and Salamone, Joseph C., to Polymer Technology Corporation. Ionic ophthalmic solutions. 4,321,261, Cl. 424-180.000.
Eloy, Fernand: *See—*
Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, 4,321,266, Cl. 424-246.000.
Elsasser, Horst: *See—*
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., 4,320,620, Cl. 59-93.000.
Emenegger, Ray. Safety switch for vehicle electrical system. 4,321,438, Cl. 200-61.45R.
Emery Industries, Inc.: *See—*
Fayter, Richard G., Jr., 4,321,406, Cl. 560-124.000.
Emhart Industries, Inc.: *See—*
Vana, John H., 4,320,631, Cl. 62-256.000.
Emile, Philip, Jr.: *See—*
Kelly, Austin T.; Emile, Philip, Jr.; and Stolpen, Alan H., 4,321,530, Cl. 324-115.000.
Emmel, Leroy L. Lattice cable and composite dielectric transmission line and method of making same. 4,321,425, Cl. 174-32.000.
Endo, Teruo: *See—*
Takahashi, Kotei; Endo, Teruo; and Kawaguchi, Masayuki, 4,320,824, Cl. 192-115.000.

Endo, Yutaka: *See*—
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, 4,321,679, Cl. 364-474.000.

Engelhard Minerals & Chemicals Corp.: *See*—
Farrauto, Robert J.; Williams, Joseph C.; and Myers, Herbert, 4,321,300, Cl. 428-332.000.

Engle, Charles J.; and Boitano, Robert A., to Gared Corporation. Shock-absorbing assembly for basketball backboard. 4,320,896, Cl. 273-1.50R.

Engle, James D.: *See*—
Blakeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., 4,321,229, Cl. 264-349.000.

English, George J.; Rothwell, Harold L., Jr.; and Keeffe, William M., to GTE Products Corporation. Low wattage, high pressure metal vapor discharge lamp for minimizing detrimental glow time. 4,321,501, Cl. 313-197.000.

Entwistle Company, The: *See*—
Allard, Joseph R., 4,320,619, Cl. 57-59.000.

Epton, Paul J.: *See*—
Bleil, Carl E.; and Epton, Paul J., 4,321,551, Cl. 330-4.300.

Erbsland, Arnold: *See*—
Steiner, Hansruedi; and Erbsland, Arnold, 4,320,710, Cl. 110-281.000.

Eriksson, Birger: *See*—
Widerby, Lennart; and Eriksson, Birger, 4,320,695, Cl. 98-40.00N.

Erker, James W., to Towmotor Corporation. Seat-operated brake assembly with brake protection means. 4,320,819, Cl. 188-109.000.

Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Measuring instrument mounting apparatus. 4,320,578, Cl. 33-125.00T.

Escherich, Karl H.: *See*—
Nickel, Manfred; and Escherich, Karl H., 4,321,110, Cl. 376-250.000.

Estep, Clayton L.: *See*—
Etherington, Roger F.; and Estep, Clayton L., 4,320,770, Cl. 128-766.000.

Esterowitz, Leon; and Eckardt, Robert C., to United States of America, Navy. Multiwavelength self-pumped solid state laser. 4,321,559, Cl. 372-41.000.

Etherington, Roger F.; and Estep, Clayton L., to Trans-Med Corporation. Diagnostic specimen collector. 4,320,770, Cl. 128-766.000.

Etoh, Yukihiro; and Tanaka, Toshiaki, to Nissan Motor Company, Limited. Internal combustion engine. 4,320,726, Cl. 123-198.00F.

Eubank, Marcus P. Combination floor, jack and trailer assemblies. 4,320,607, Cl. 52-143.000.

Evans, William P.; and Kline, Jan C., to Caterpillar Tractor Co. Nucleonic gauge for determining lubricant level in a joint and method. 4,321,469, Cl. 250-358.00R.

Everex Corporation: *See*—
Rexroth, Klaus W. O., 4,321,023, Cl. 425-66.000.

Evtuhov, Viktor, to Hughes Aircraft Company. Phase conjugate correction for high gain amplifier systems. 4,321,550, Cl. 330-4.300.

Exxon Research & Engineering Co.: *See*—
Bacsik, George J., 4,321,130, Cl. 208-130.000.
Klein, Robert R.; and Makowski, Henry S., 4,321,340, Cl. 525-344.000.
Kurth, William T.; and Andrulitis, William B., 4,321,417, Cl. 136-246.000.
Maas, Edward T., Jr.; and Cox, Donald M., 4,321,116, Cl. 204-158.00R.
McVicker, Gary B., 4,321,211, Cl. 260-429.00R.
Ryu, Ji-Yong; Rao, Krishna K.; Spohn, Ralph J.; and Drogin, Robert, 4,321,402, Cl. 560-24.000.

FA. Maschinenfabrik Buckau R. Wolf AG: *See*—
Bechthold, Horst, 4,321,241, Cl. 423-242.000.

Fahnler, Friedrich: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,321,336, Cl. 525-183.000.

Fairchild Camera and Instrument Corporation: *See*—
Bechdolt, Robert W., 4,321,490, Cl. 307-456.000.
Matrone, John L., 4,321,533, Cl. 324-158.00F.

Fanstini, Franco: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.

Fantuzzo, Joseph, to Xerox Corporation. Combined processing unit. 4,320,958, Cl. 355-3.0DD.

Faraghan, Geoffrey T.: *See*—
Jerome, Jonathan A.; Neu, Frank D.; and Faraghan, Geoffrey T., 4,321,622, Cl. 358-128.500.

Farmitalia Carlo Erba, S.p.A.: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.
Mantegani, Sergio; Arcari, Guiliana; Caravaggi, Anna M.; and Bosisio, Germano, 4,321,381, Cl. 546-67.000.

Farr, Glyn P. R., to Lucas Industries Limited. Pump unloader and accumulator charging valve. 4,320,622, Cl. 60-418.000.

Farr, Glyn P. R., to Girling Limited. Fluid-pressure operated boosters for vehicle braking systems. 4,320,623, Cl. 60-547.00R.

Farr, Robert A.: *See*—
Lundberg, Charles A., Jr.; and Farr, Robert A., 4,321,382, Cl. 546-95.000.

Farrauto, Robert J.; Williams, Joseph C.; and Myers, Herbert, to Engelhard Minerals & Chemicals Corp. Thin film solar energy collector. 4,321,300, Cl. 428-332.000.

Farrington, Diane G.; and White, James F., to Standard Oil Company. Method for the activation of phosphomolybdic acid based catalysts. 4,321,160, Cl. 252-437.000.

Fas, Hans: *See*—
Burkhard, Lorenz; and Fas, Hans, 4,321,106, Cl. 159-49.000.

Fasano, Michael: *See*—
De Luca, Paul V.; and Fasano, Michael, 4,321,650, Cl. 361-119.000.

Faure, Michel: *See*—
Dubos, Jacques; Faure, Michel; and Lumineau, Yves, 4,321,072, Cl. 65-3.110.

Fayter, Richard G., Jr., to Emery Industries, Inc. Vinylcyclopropane monomers and oligomers. 4,321,406, Cl. 560-124.000.

Fedeli, Luisa. Structure blade effective to be applied to rotating grass-cutting machines. 4,320,617, Cl. 56-295.000.

Federal Pacific Electric Company: *See*—
McGarrity, Richard V., 4,321,436, Cl. 200-48.0KB.

Feinman, Jerome; and McGreal, Joseph E., Jr., to United States Steel Corporation. Low sulfur content hot reducing gas production using calcium oxide desulfurization with water recycle. 4,321,242, Cl. 423-244.000.

Feldbrugge, Alonzo H. R.: *See*—
Roy, Pradip K.; Feldbrugge, Alonzo H. R.; and Bresnahan, David P., 4,321,280, Cl. 426-276.000.

Felder, Louis; Kirchmayr, Rudolf; and Husler, Rinaldo, to Ciba-Geigy Corporation. Bis benzoyl sensitizers for photopolymerization or photo cross linking process and composition. 4,321,118, Cl. 204-159.180.

Feldstein, Nathan, to Surface Technology, Inc. Electroless plating. 4,321,285, Cl. 427-97.000.

Felix, Cristian J.; and Genaro, Donald M., to PepsiCo Inc. Vending machine with common panel structure. 4,320,933, Cl. 312-223.000.

Ferag AG: *See*—
Reist, Walter; and Honegger, Werner, 4,320,894, Cl. 271-277.000.

Fernandes, Prabhavathi B.: *See*—
Nardi, Ronald V.; and Fernandes, Prabhavathi B., 4,321,120, Cl. 204-180.00G.

Ferrara, Angelo: *See*—
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,320,855, Cl. 222-56.000.

Ferrieu, Gilbert M. M., to Telecommunications Radioelectriques et Telephoniques T.R.T. Subscriber's connecting network comprising a symmetrical power amplifier for feeding a subscriber's line. 4,321,430, Cl. 179-18.0FA.

Fidler, Thomas D.; and Sapino, Anthony P., to Computer Peripherals, Inc. Bi-directional ink jet printer. 4,321,609, Cl. 346-75.000.

Fields, Spencer: *See*—
Nix, Paul T.; and Fields, Spencer, 4,321,397, Cl. 548-366.000.

Fields, Wallice E. Bowling-ball return device. 4,320,897, Cl. 273-49.000.

Figini, Mario: *See*—
Mia, Gian V.; and Figini, Mario, 4,320,980, Cl. 400-70.000.

Findeisen, Kurt: *See*—
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,321,394, Cl. 548-234.000.

Firth, William C., Jr., to Union Camp Corporation. Media for stimulating growth in foliage plants. 4,321,076, Cl. 71-24.000.

Fischer, David: *See*—
Kohlert, Rudolf; and Fischer, David, 4,320,675, Cl. 82-43.000.

Fischer, Helmut: *See*—
Jochmann, Franz; Fischer, Helmut; Dietz, Wolfgang; and Bauernfeind, Olaf, 4,321,579, Cl. 340-52.00F.

Fischer, Karl. Method and apparatus for manufacture of a vessel. 4,320,644, Cl. 72-75.000.

Fisher, Michael H.: *See*—
Wang, Ching C.; and Fisher, Michael H., 4,321,267, Cl. 424-263.000.
Wang, Ching C.; and Fisher, Michael H., 4,321,274, Cl. 424-304.000.

Fives-Cail Babcock: *See*—
Henin, Jean-Pierre, 4,321,238, Cl. 423-167.000.

Flink, Joseph H.: *See*—
Bertrand, John; Flink, Joseph H.; Shamah, Daniel; and Hosking, Rodger H., 4,321,680, Cl. 364-485.000.

Flint, Leslie; and Brown, Malcolm P., to Marwin Foundry Units Limited. Air supply units. 4,320,755, Cl. 128-205.120.

Florida Machine & Foundry Co.: *See*—
Bowes, Stephen M., Jr., 4,320,925, Cl. 299-90.000.

Florkey, Arthur G. Pitching track game. 4,320,902, Cl. 273-352.000.

Flynn, Richard T.; and Kindell, Jerry L., to Honeywell Information Systems Inc. Prediction of number of data words transferred and the cycle at which data is available. 4,321,668, Cl. 364-200.000.

Fodor, Eben V.; King, John M.; and King, Folly F. Solar heated portable structure. 4,320,744, Cl. 126-450.000.

Fogel Commercial Refrigerator Company: *See*—
Donnelly, Joseph H., 4,320,626, Cl. 62-3.000.

Folkerts, Michael A.: *See*—
Moore, Donn F.; and Folkerts, Michael A., 4,321,610, Cl. 346-108.000.

Folmer, Carroll W.: *See*—
Grace, Thad N.; Folmer, Carroll W.; and Logan, Douglas W., 4,320,912, Cl. 292-341.180.

Ford Aerospace & Communications Corp.: *See*—
Ho, Pang T., 4,321,527, Cl. 324-58.00A.
Wagner, Gary L., 4,321,553, Cl. 330-265.000.

Ford Motor Company: *See*—
Braun, Paul E.; Lopiccola, Joseph F.; and Freismuth, Richard J., 4,320,731, Cl. 123-440.000.

Moore, Donald E., 4,320,853, Cl. 220-375.000.
Fordham, Roger G., to General Electric Company Limited, The. Overcurrent relays. 4,321,647, Cl. 361-97.000.
Foresight Industries: *See*—
Deike, Robert F., 4,320,608, Cl. 52-165.000.
Forrester, John S.; and Rendall, David, to Lucas Industries Limited. Load transducer. 4,320,667, Cl. 73-862.640.
Forster, Kevin G.: *See*—
Carr, Charles W.; and Forster, Kevin G., 4,320,694, Cl. 92-161.000.
Fortunato, Gerard; Marechal, Robert A.; and Menetrier, Marc G. Y., to Agence Nationale de Valorisation de la Recherche (ANVAR). Device for interferential spectrometry with selective modulation. 4,320,973, Cl. 356-346.000.
Fourcade, Claude: *See*—
Cathignol, Dominique; Fourcade, Claude; and Chapelon, Jean-Yves, 4,320,765, Cl. 128-663.000.
Frahm, Veryl H., Jr.: *See*—
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,321,089, Cl. 75-84.500.
Francia, Giovanni. Control system and method for controlling a solar energy plant. 4,320,663, Cl. 60-667.000.
Franssen, Nico V.; Van Maanen, Gerardus A.; and Kockelmans, Henricus G. J. M., to U.S. Philips Corporation. Amplifier comprising a first and a second amplifier element. 4,321,552, Cl. 330-81.000.
Frazer, Robert E.: *See*—
United States of America, National Aeronautics and Space Administration; and Frazer, Robert E., 4,321,299, Cl. 428-247.000.
Frederick, Gary L., to Garrett Corporation, The. Anti-ice control system. 4,320,872, Cl. 236-80.00A.
Freedman, Morris D.: *See*—
Tasar, Omur; Whiteside, Arliss E.; and Freedman, Morris D., 4,321,666, Cl. 364-200.000.
Freeman, Albert J. Fire retardant seal. 4,320,611, Cl. 52-309.100.
Freezinhot Bottle Co., Ltd.: *See*—
Hoi, Cheung T., 4,321,657, Cl. 362-183.000.
Freismuth, Richard J.: *See*—
Braun, Paul E.; Lopiccola, Joseph F.; and Freismuth, Richard J., 4,320,731, Cl. 123-440.000.
Freudenberg, Bertram: *See*—
Schuhmacher, Gunter; Freudenberg, Bertram; and Muhlfeld, Horst, 4,321,173, Cl. 525-453.000.
Frito-Lay, Inc.: *See*—
Hilton, Barney W.; Lin, Robert I.; and Crnkovich, Greg, 4,320,658, Cl. 73-437.000.
Fritz Eichenauer, Firma: *See*—
Ohnmacht, Helmut; and Meywald, Klaus, 4,321,456, Cl. 219-364.000.
Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Medical stapling device. 4,321,002, Cl. 411-457.000.
Frye, Lonnie E.: *See*—
Polhemus, Marlan H.; and Frye, Lonnie E., 4,320,835, Cl. 206-411.000.
Fryer, Rodney I.; and Gilman, Norman W., to Hoffmann-La Roche Inc. Thiazolo[5,4-d][2] benzazepines and intermediates. 4,321,199, Cl. 260-326.00A.
Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo, 4,321,462, Cl. 250-211.00J.
Fuji Xerox Co., Ltd.: *See*—
Shimazaki, Shigeru; Uehara, Yasuhiro; and Nishide, Hiroo, 4,320,714, Cl. 118-60.000.
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, to Hitachi, Ltd. Work setting system for manufacturing process. 4,321,679, Cl. 364-474.000.
Fujii, Hidetsugu: *See*—
Ono, Hiroshi; Fujii, Hidetsugu; Morikawa, Haruyuki; and Fukui, Akito, 4,321,410, Cl. 564-67.000.
Fujii, Katsuhiko; Ueda, Minoru; and Minekawa, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha; and Ohtsu Tire & Rubber Co., Ltd., The. Pneumatic tire bead comprising high modulus fibers and polyurethane matrix. 4,320,791, Cl. 152-362.00R.
Fujii, Tadashiro: *See*—
Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, 4,321,376, Cl. 544-277.000.
Fujii, Toshinobu; Hirose, Takashi; and Kondo, Naoki, to Meidensha Electric Mfg. Co., Ltd. Metal-halogen secondary battery system. 4,321,312, Cl. 429-12.000.
Fujii, Tsuyoshi; and Yanagida, Isao, to Hitachi, Ltd. Runner liner of fluid machine and method of fixing the same. 4,321,009, Cl. 415-172.00R.
Fujimoto, Shoji: *See*—
Takaoka, Shuji; and Fujimoto, Shoji, 4,320,812, Cl. 180-143.000.
Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,321,525, Cl. 323-281.000.
Fujitsu Ltd.: *See*—
Higuchi, Mitsuo; Nakamura, Kazuhisa; and Maeda, Kohichi, 4,321,489, Cl. 307-362.000.
Nakajo, Toshihiko; Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,321,654, Cl. 361-396.000.
Fujiwara, Ken-ichi: *See*—
Takatsuki, Toshiharu; Fujiwara, Ken-ichi; Yanagisawa, Sinobu; and Okamura, Shigeru, 4,321,429, Cl. 179-2.0DP.
Fujiwara, Kouhei; and Hosogai, Setsuo, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with extended contact separation after trip. 4,321,440, Cl. 200-153.00G.
Fukuchi, Fumio: *See*—
Ito, Genji; Tsunoo, Mitsunobu; and Fukuchi, Fumio, 4,320,674, Cl. 81-54.000.
Fukui, Akito: *See*—
Ono, Hiroshi; Fujii, Hidetsugu; Morikawa, Haruyuki; and Fukui, Akito, 4,321,410, Cl. 564-67.000.
Fukui, Tadahiro: *See*—
Minamide, Seiko; Okuda, Makoto; Nakata, Shinobu; and Fukui, Tadahiro, 4,321,287, Cl. 427-157.000.
Fukuoka, Norio, to Olympus Optical Company Ltd. Data recorder with computer display interface. 4,321,642, Cl. 360-137.000.
Fumagalli, Angelo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.
Funakubo, Tomoki: *See*—
Nishikawa, Masaji; Kasuga, Muneo; and Funakubo, Tomoki, 4,320,956, Cl. 355-3.0CH.
Furukawa, Tokinobu: *See*—
Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, 4,321,344, Cl. 526-64.000.
Gabor, Robert J.; Tengler, John N.; and Braund, Kenneth W., to A P Products Incorporated. Breadboard system. 4,321,588, Cl. 340-381.000.
Gaddy, Herschel J.: *See*—
Johanning, Gary L.; Muhrer, Merle E.; and Gaddy, Herschel J., 4,321,278, Cl. 426-69.000.
GAF Corporation: *See*—
Lorenz, Donald H.; and Gruber, Bruce A., 4,321,396, Cl. 548-260.000.
Gale, Anthony G.: *See*—
Wilkinson, Wilfred H.; Pateman, Edwin; Gale, Anthony G.; and Slinger, John, 4,321,010, Cl. 416-92.000.
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, to Bergwerksverband GmbH. Device for opening, closing and cleaning fill holes of coke oven chargeable by a coal conveyor. 4,321,112, Cl. 202-241.000.
Galvin, Aaron A.; and Guscott, John K., to American District Telegraph Company. Passive infrared detector. 4,321,594, Cl. 340-567.000.
Galvin, Aaron A.: *See*—
Crandall, Richard E.; Apsell, Sheldon P.; and Galvin, Aaron A., 4,321,592, Cl. 340-541.000.
Gambro Dialysatoren KG: *See*—
Lehmann, Hans-Dieter, 4,321,350, Cl. 528-48.000.
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, to Farmitalia Carlo Erba, S.p.A. 15-Epi-prostacyclin and analogous prostacyclins. 4,321,205, Cl. 260-346.220.
GangaRao, Hota V. S., to Home Crafts Corporation. Reinforced concrete panels and building constructed therewith. 4,320,606, Cl. 52-125.000.
Garbo, Paul W. Use of land-fill gas to stimulate crude oil production and to recover methane-rich gas. 4,320,802, Cl. 166-267.000.
Gardner, Jeffrey M., to Container Corporation of America. Container sleeve. 4,320,866, Cl. 229-37.00R.
Gardner, Jeffrey M., to Container Corporation of America. Partition structure. 4,320,867, Cl. 229-42.000.
Gared Corporation: *See*—
Engle, Charles J.; and Boitano, Robert A., 4,320,896, Cl. 273-1.50R.
Garrett Corporation, The: *See*—
Frederick, Gary L., 4,320,872, Cl. 236-80.00A.
McCoy, Allan W., 4,321,008, Cl. 415-157.000.
Garrett, Wylie P. Rotary drill bit. 4,320,808, Cl. 175-340.000.
Gates Rubber Company, The: *See*—
Hammel, Ronald O., 4,321,523, Cl. 320-14.000.
Gavogiannis, Panayotis, to Chrosticai Sidirou Co., Ltd. Process for the production of artificial iron oxide. 4,321,249, Cl. 423-632.000.
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, to Dynamit Nobel AG. Electronic projectile fuse. 4,320,704, Cl. 102-218.000.
GCA Corporation: *See*—
Lilienfeld, Pedro, 4,320,975, Cl. 356-364.000.
Gebr. Lodige Maschinenbau GmbH: *See*—
Lucke, Roland, 4,320,979, Cl. 366-325.000.
Gebrueder Buehler AG: *See*—
Gmur, Bruno, 4,320,615, Cl. 53-67.000.
Geerke, Johan H.: *See*—
Eckenhoff, James B.; Geerke, Johan H.; and Landrau, Felix A., 4,320,758, Cl. 128-260.000.
Geist, Bernard W.: *See*—
Novak, Raymond F.; and Geist, Bernard W., 4,320,864, Cl. 227-130.000.
Gelman Sciences, Inc.: *See*—
Ambler, Jeffrey, 4,321,119, Cl. 204-180.00R.
Genaro, Donald M.: *See*—
Felix, Cristian J.; and Genaro, Donald M., 4,320,933, Cl. 312-223.000.
General Electric Company: *See*—
Adler, Michael S.; and Huber, Paul G., 4,321,508, Cl. 315-291.000.
Ashby, Bruce A., 4,321,400, Cl. 556-416.000.
Brezosky, Bernard J., 4,320,614, Cl. 52-630.000.
Brunelle, Daniel J., 4,321,356, Cl. 528-200.000.
Brunst, George E.; Thomas, Francis E.; and Wanner, Walter W., 4,320,898, Cl. 273-51.000.
Carlson, Richard O., 4,321,577, Cl. 338-35.000.

Hammer, Edward E.; and Lemmers, Eugene, 4,321,502, Cl. 313-198.000.
Hickey, John S., 4,321,496, Cl. 310-179.000.
Hill, Michael S., 4,321,455, Cl. 219-123.000.
Mark, Victor, 4,321,202, Cl. 260-326.860.
McMillan, Stephen L., 4,320,636, Cl. 68-23.00R.
Pierce, Linden W., 4,321,421, Cl. 174-11.00R.
Plunkett, Allan B.; and Turnbull, Fred G., 4,321,478, Cl. 307-47.000.
Schaeffer, Friedrich K.; and Brennan, Thomas F., 4,321,426, Cl. 174-34.000.
Tiemann, Jerome J., 4,321,481, Cl. 307-221.00D.
Vogt, George H., 4,321,498, Cl. 310-215.000.
Weischedel, Richard C., 4,321,526, Cl. 323-286.000.
Westphal, Bernd A. K.; Moore, James H., Jr.; and Livingston, Richard G., 4,320,625, Cl. 60-646.000.

General Electric Company Limited, The: *See*—
Fordham, Roger G., 4,321,647, Cl. 361-97.000.

General Foods Corporation: *See*—
Roy, Pradip K.; Feldbrugge, Alonzo H. R.; and Bresnahan, David P., 4,321,280, Cl. 426-276.000.
Schopf, Larry D.; Sakowicz, Jerome K.; and Trenk, Hugh L., 4,321,279, Cl. 426-106.000.

General Motors Corporation: *See*—
Bleil, Carl E.; and Epton, Paul J., 4,321,551, Cl. 330-4.300.
MacIver, Bernard A., 4,321,317, Cl. 430-5.000.

General Signal Corporation: *See*—
Bachle, Walter W., 4,320,882, Cl. 248-70.000.
Sibley, Henry C., 4,320,880, Cl. 246-34.00R.

Genese, Joseph N., to Abbott Laboratories. Flow control device with roller orientation means. 4,320,889, Cl. 251-6.000.

Gentemann, Gerhard A., administrator: *See*—
Moslener, Manfred, deceased; and Gentemann, Gerhard A., administrator, 4,321,222, Cl. 264-24.000.

Georgetown University Medical Center: *See*—
Ledley, Robert S.; and Golab, Thomas, 4,320,768, Cl. 128-733.000.

Gersonde, Klaus: *See*—
Nicolau, Yves-Claude; and Gersonde, Klaus, 4,321,259, Cl. 424-101.000.

Gesser, Gernot; Hauer, Franz; Racky, Berthold; and Klein, Dieter. Container for receiving and storing spent fuel elements. 4,320,847, Cl. 220-67.000.

Gibbs, Charles G., to Gulf Oil Corporation. Arylthioureidoisoindolines. 4,321,200, Cl. 260-326.100.

Gibson, Walter G.; and Liu, Frank C., to RCA Corporation. AFT Circuit. 4,321,624, Cl. 358-195.100.

Giffin, Lloyd. Vertical breadbox or the like. 4,320,932, Cl. 312-71.000.

Gilberts, Alexander G., to Reliable Electric Company. Surge voltage arrester with ventsafe feature. 4,321,649, Cl. 361-119.000.

Gilbertson, Thomas A. Oil well pump driving unit. 4,320,799, Cl. 166-68.500.

Gilman, Norman W.: *See*—
Fryer, Rodney I.; and Gilman, Norman W., 4,321,199, Cl. 260-326.00A.

Gipson, Robert M.: *See*—
McCoy, David R.; Gipson, Robert M.; and Young, Kitchener B., 4,321,146, Cl. 210-708.000.
McCoy, David R.; Gipson, Robert M.; Young, Kitchener B.; and LaBerge, Colin L., 4,321,148, Cl. 210-708.000.

Girling Limited: *See*—
Farr, Glyn P. R., 4,320,623, Cl. 60-547.00R.

Glacier GmbH-Deva Werke: *See*—
Greb, Gerhard, 4,320,549, Cl. 14-16.100.

Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., to Owens-Corning Fiberglas Corporation. Method and apparatus for manufacturing glass fibers. 4,321,074, Cl. 65-12.000.

Glassman, Stephen M.; Kice, James D.; and Ryding, Paul A., to KRG, Inc. Livestock splint. 4,320,722, Cl. 119-96.000.

Glesmann, Herbert C.: *See*—
Rowe, Murray A.; Glesmann, Herbert C.; and Ulmer, Ewald, 4,320,987, Cl. 404-115.000.

Glowacki, Pierre A.: *See*—
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,320,903, Cl. 277-22.000.

Gmur, Bruno, to Gebrueder Buehler AG. Apparatus for the automatic filling of bags at the discharge spout of a filling hopper. 4,320,615, Cl. 53-67.000.

Goddard, Denis A.; and Dennis, Louis E., Jr., to Beloit Corporation. Fourdrinier table. 4,321,108, Cl. 162-272.000.

Golab, Thomas: *See*—
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Goldstein, Albert S., Jr.: *See*—
Clark, Wallace; and Goldstein, Albert S., Jr., 4,320,929, Cl. 308-230.000.

Gole, Francois; and Rocroi, Jean-Pierre, to Compagnie Generale de Geophysique. Electric prospecting of the subsoil with lineal electrodes. 4,321,540, Cl. 324-357.000.

Golke, Heinz: *See*—
Leinberger, Klaus; and Golke, Heinz, 4,320,874, Cl. 239-403.000.

Golz, Hans-Joachim; and Bauck, Uwe, to VARTA Batterie Aktiengesellschaft. Method and apparatus for testing charged and dry storable lead storage batteries. 4,321,542, Cl. 324-426.000.

Gomi, Tsuguo; and Takeda, Osamu, to Kabushiki Kaisha Suwa Seikosha. Temperature compensated quartz wristwatch with memory stored predetermined temperature compensating data. 4,321,698, Cl. 368-202.000.

Gong, Cheng S.: *See*—
Chen, Li F.; Gong, Cheng S.; and Tsao, George T., 4,321,327, Cl. 435-161.000.

Gonsiorawski, Ronald: *See*—
Patel, Kirit B.; and Gonsiorawski, Ronald, 4,321,283, Cl. 427-74.000.

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Henderson, James N.; and Sandstrom, Paul H., 4,321,171, Cl. 526-84.000.

Gordon, Hilton P.; Richards, Arthur W.; Hawkins, Albert P.; and Boyle, Alan, to Sphere Investments Limited. Detection and sorting systems. 4,320,841, Cl. 209-552.000.

Gorecki, Henryk: *See*—
Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, 4,321,077, Cl. 71-40.000.

Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, to Jenoptik Jena G.m.b.H. Measuring system for alignment and measurement with an electronic tachymeter. 4,321,683, Cl. 364-561.000.

Gottliebson, Mayo. Pneumatic ejector control. 4,321,017, Cl. 417-128.000.

Goudey, Robert B. Air deflector duct. 4,320,920, Cl. 296-1.00S.

Grace, Thad N.; Folmer, Carroll W.; and Logan, Douglas W., to Rohr Industries, Inc. Cowl door latch adjustment fitting assembly. 4,320,912, Cl. 292-341.180.

Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, to Hoechst Aktiengesellschaft. Process for the purification of wet-processed phosphoric acid. 4,321,245, Cl. 423-321.00S.

Grafe, Alfred: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,321,194, Cl. 260-239.00E.

Grambow, Lutz; and Kruger, Dieter, to Dragerwerk AG. Electronic calibration of electrochemical sensors. 4,321,113, Cl. 204-1.00T.

Granzow, Albrecht H., to American Cyanamid Company. Phosphinic acid flame retardants for polyphenylene ether resins. 4,321,187, Cl. 524-133.000.

Grasser, Hans: *See*—
Meisner, Alfred; and Grasser, Hans, 4,321,697, Cl. 368-187.000.

Gray, Ian: *See*—
Harris, Richard G.; and Gray, Ian, 4,321,157, Cl. 252-174.250.

Greb, Gerhard, to Glacier GmbH-Deva Werke. Rocker-sliding bearing assembly and a method of lining the assembly. 4,320,549, Cl. 14-16.100.

Green, John D., to Manville Service Corporation. Method and assembly for measuring equivalent sphere illumination in the field. 4,320,969, Cl. 356-221.000.

Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Fluid actuating device for an electric circuit breaker. 4,321,435, Cl. 200-82.00B.

Grillot, Ronald E.: *See*—
Howk, Max E.; Slentz, Gale E.; and Grillot, Ronald E., 4,321,555, Cl. 331-1.00A.

Grimmer, Paul D.; and Swiatosz, Edmund, to United States of America, Navy. Recoil force and weight loss simulation device. 4,321,043, Cl. 434-18.000.

Grohe, Lester R., to Northrop Corporation. Two degree of freedom gyro having an axial gap permanent magnet motor. 4,320,669, Cl. 74-5.370.

Grosbois, Jean: *See*—
Magnier, Claude; and Grosbois, Jean, 4,321,244, Cl. 423-320.000.

Groupement Franco-Senagalais d'Etudes et de Recherches Industrielles: *See*—
Magnier, Claude; and Grosbois, Jean, 4,321,244, Cl. 423-320.000.

Grub, Rainer. Hydroelectric power generating arrangement. 4,321,475, Cl. 290-52.000.

Gruber, Bruce A.: *See*—
Lorenz, Donald H.; and Gruber, Bruce A., 4,321,396, Cl. 548-260.000.

Gruich, Peter. Fabricated industrial fastener. 4,321,001, Cl. 411-396.000.

Gruver, Floyd O., Jr., to Coleman Company, Inc., The. Gaseous lantern ventilator assembly. 4,321,656, Cl. 362-180.000.

GTE Laboratories Incorporated: *See*—
Sano, Jun-ichi, 4,321,661, Cl. 363-60.000.

GTE Products Corporation: *See*—
Brower, Boyd G.; and Shaffer, John W., 4,320,572, Cl. 29-832.000.
English, George J.; Rothwell, Harold L., Jr.; and Keeffe, William M., 4,321,501, Cl. 313-197.000.
Hawxhurst, Margaret H.; and Slobbe, Walter W., 4,321,149, Cl. 210-720.000.
Keeffe, William M.; Rothwell, Harold L., Jr.; and Scholz, John A., 4,321,504, Cl. 313-214.000.

Guffens, Joseph H. M.; and Van Gunst, Christiaan A., to Stamicarbon, B.V. Process for the preparation of an electrically conducting thermoplastic elastomer. 4,321,162, Cl. 252-511.000.

Guillon, Philippe: *See*—
Antoniotti, Pierre; Matge, Alain; and Guillon, Philippe, 4,320,833, Cl. 206-309.000.

Gulf Oil Corporation: *See*—
Gibbs, Charles G., 4,321,200, Cl. 260-326.100.

Gulf Research & Development Co.: *See*—
Beach, David L.; and Zambelli, Adolfo, 4,321,347, Cl. 526-151.000.

Gunnersen, Carl E.; and Mathis, Terry D., to Bell Telephone Laboratories, Incorporated. Resilient optical fiber connector. 4,320,938, Cl. 350-96.210.

Gupner, Otto; and Steuernagel, Walter, to Metallgesellschaft Aktiengesellschaft. Corona-discharge electrode system. 4,321,067, Cl. 55-135.000.

Gupta, Paramanda: *See*—
Batt, Colin B.; Daffern, David; and Gupta, Paramanda, 4,321,094, Cl. 106-32.000.
Gupta, Umesh C., to Kollmorgen Technologies Corporation. Brush track laminated printed circuit motor and armature. 4,321,499, Cl. 310-268.000.
Gupta, Vijai P., to Atlantic Richfield Company. Process for decreasing the rate of titanium corrosion. 4,321,231, Cl. 422-12.000.
Gurries, Raymond A., to Resonant Technology Company. Resonant system support. 4,320,807, Cl. 173-49.000.
Gurske, William A., to Beckman Instruments, Inc. Electrophoretic technique for separating lactate dehydrogenase isoenzymes and improved electrophoretic gel for use therein. 4,321,121, Cl. 204-180.00G.
Guscott, John K.: *See*—
Galvin, Aaron A.; and Guscott, John K., 4,321,594, Cl. 340-567.000.
Gusyatiner, Mikhail M.: *See*—
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.
Guthikonda, Ravindra: *See*—
Cama, Lovji D.; Guthikonda, Ravindra; and Christensen, Burton G., 4,321,197, Cl. 260-245.20T.
Gwyn, John E.; and Roberts, Scott C., to Shell Oil Company. Process for heat transfer with dilute phase fluidized bed. 4,320,795, Cl. 165-1.000.
Habermehl, Diethard: *See*—
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.
Haddad, Heskel M. Surgical device for excision of tissue. 4,320,761, Cl. 128-305.000.
Haga, Takahiro: *See*—
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, 4,321,388, Cl. 546-291.000.
Hajek, Josef; Rotter, Siegfried; Schwopfinger, Hans; and Schwarz, Josef, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Method of making a folding former. 4,321,051, Cl. 493-439.000.
Halcon SD Group, Inc., The: *See*—
Costa, Lawrence C., 4,321,414, Cl. 568-862.000.
Halliburton Company: *See*—
Baldridge, Morris G.; Knox, Lloyd C.; and Sullaway, Bob L., 4,320,992, Cl. 405-223.000.
Haltsonen, Eino J.; and Oksanen, Martti T., to Valmet Oy. Apparatus for changing fabrics in paper manufacturing machines. 4,321,109, Cl. 162-274.000.
Hamabata, Toshihiro: *See*—
Umeki, Shinji; Hamabata, Toshihiro; Onuki, Kazuaki; and Takada, Kazuo, 4,321,302, Cl. 428-404.000.
Hammel, Ronald O., to Gates Rubber Company, The. Battery charger and power supply circuitry. 4,321,523, Cl. 320-14.000.
Hammer, Edward E.; and Lemmers, Eugene, to General Electric Company. U-Shaped discharge lamp with starting strip. 4,321,502, Cl. 313-198.000.
Hamprecht, Gerhard: *See*—
Parg, Adolf; Wuerzer, Bruno; and Hamprecht, Gerhard, 4,321,371, Cl. 544-92.000.
Hanafin, Maurice C. Solar panel cover assembly. 4,321,419, Cl. 136-251.000.
Haney, John W. Wet sander. 4,320,601, Cl. 51-391.000.
Hanna, John L.: *See*—
Kimzey, Paul W.; and Hanna, John L., 4,320,556, Cl. 15-347.000.
Hannula, Fred W.: *See*—
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Hansen, Glen D.: *See*—
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Hansen, Guenter; Kermer, Wolf-Dieter; and Kolbinger, Hans J., to BASF Aktiengesellschaft. Navy dye mixtures and their use in dyeing polyesters. 4,321,055, Cl. 8-639.000.
Hansen, James P., to United States of America, Navy. Switching quadrature detector. 4,321,549, Cl. 329-50.000.
Harada, Tsuneo: *See*—
Miyahara, Yoshihisa; Kobayashi, Kimimasa; Kobayashi, Yawara; and Harada, Tsuneo, 4,321,459, Cl. 219-544.000.
Hardy, Robert A., Jr.: *See*—
Brown, John J.; and Hardy, Robert A., Jr., 4,321,379, Cl. 546-16.000.
Harigane, Kotaro; and Ito, Tetsuro, to Tokyo Denki Kagaku; and Kogyo Kabushiki Kaisha. Inserting assembly for automatically inserting parallel lead electronic component into openings in a printed circuit board. 4,320,574, Cl. 29-741.000.
Harper, Rex M.: *See*—
Morrison, Howard J.; Breslow, Jeffrey D.; and Harper, Rex M., 4,320,901, Cl. 273-237.000.
Harris, Paul J.: *See*—
Allcock, Harry R.; and Harris, Paul J., 4,321,217, Cl. 260-543.0PN.
Harris, Ralph A.; and Carroll, Paul E., to Texas Instruments Incorporated. Method and apparatus for increasing the dynamic range of a data acquisition system at low frequencies without reducing high frequency gain. 4,321,675, Cl. 364-421.000.
Harris, Richard G.; and Gray, Ian, to Procter & Gamble Company, The. Granular laundry compositions. 4,321,157, Cl. 252-174.250.
Harrison, Michael; and Davis, Wilbern F., to Data General Corporation. Matrix printhead apparatus. 4,320,981, Cl. 400-124.000.
Hart, Kenneth R.: *See*—
Henfrey, Basil; and Hart, Kenneth R., 4,321,227, Cl. 264-167.000.
Hart, Peter J., to Phillips Petroleum Company. Rhodium-containing perovskite-type catalysts. 4,321,250, Cl. 423-652.000.
Hartmann, Joseph L.: *See*—
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Hartwig-Hartoglass, Inc.: *See*—
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Haruna, Tohru: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,321,191, Cl. 524-285.000.
Harvey Hubbell Incorporated: *See*—
Elbert, Charles F., 4,320,820, Cl. 191-39.000.
Hasegawa, Norio; Yamamoto, Naoki; and Yanazawa, Hiroshi, to Hitachi, Ltd. Photoetching method. 4,321,104, Cl. 156-643.000.
Hasegawa, Tatsuru; Ohmi, Yasuo; Ricketts, Guy A. G.; and Sime, Stuart J., to Lever Brothers Company. Shampoo containing a polyglycol-polyamine condensation resin and a phosphate ester. 4,321,256, Cl. 424-70.000.
Hashimoto, Koichi; and Nishimura, Takamasa, to Toray Industries, Incorporated. Thermal-fusible tape of a warp knitted fabric. 4,320,634, Cl. 66-202.000.
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, to Nippon Kogaku K.K. Spectrophotometer. 4,320,971, Cl. 356-328.000.
Hashimoto, Shunichi: *See*—
Konishi, Hiroyuki; Hashimoto, Shunichi; and Oshio, Hiromichi, 4,321,081, Cl. 71-88.000.
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Hauck, James H., to International Rectifier Corporation. Stencil mask process for high power, high speed controlled rectifiers. 4,320,571, Cl. 29-591.000.
Hauer, Franz: *See*—
Gesser, Gernot; Hauer, Franz; Racky, Berthold; and Klein, Dieter, 4,320,847, Cl. 220-67.000.
Hauni-Werke Korber & Co. KG: *See*—
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Pinck, Peter; Heitmann, Uwe; Baier, Anton; and Helms, Adolf, 4,320,773, Cl. 131-281.000.
Hawkins, Albert P.: *See*—
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Hawwass, Ebrahim; Hawwass, Hassan; Nassif, John; Cajal, Victor A.; and Krone, Kenneth T. Electronic game. 4,321,673, Cl. 364-412.000.
Hawwass, Hassan: *See*—
Hawwass, Ebrahim; Hawwass, Hassan; Nassif, John; Cajal, Victor A.; and Krone, Kenneth T., 4,321,673, Cl. 364-412.000.
Hawxhurst, Margaret H.; and Slobbe, Walter W., to GTE Products Corporation. Process for removing multivalent metals from waste effluents. 4,321,149, Cl. 210-720.000.
Hayden, Howard A. Continuous hardening of high speed steel. 4,321,098, Cl. 148-14.000.
Hayward, Ian: *See*—
Pickard, Gordon W.; and Hayward, Ian, 4,321,547, Cl. 328-133.000.
Hazeltine Corporation: *See*—
Lopez, Alfred R., 4,321,605, Cl. 343-844.000.
Heasman, Peter J. R., to Imperial Chemical Industries Limited. Oil boom. 4,320,990, Cl. 405-66.000.
Heeger, Alan J.: *See*—
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., 4,321,114, Cl. 204-2.100.
Heibein, Harry P.; and Tsao, Chein-Hwa S., to International Business Machines Corporation. Scaling aerodynamic compensation in an ink jet printer. 4,321,607, Cl. 346-75.000.
Heindl, Reinhold: *See*—
Edel, Wilhelm; Heindl, Reinhold; Isenhardt, Friedel; and Schultze-Rhonhof, Ernst, 4,321,457, Cl. 219-497.000.
Heinemann, Otto; Lucke, Helmut; Schossler, Werner; Heiringhoff, Burkhard; and Krumme, Helmut, to Krupp Polysius AG. Hydrostatic bearing apparatus. 4,320,926, Cl. 308-9.000.
Heiringhoff, Burkhard: *See*—
Heinemann, Otto; Lucke, Helmut; Schossler, Werner; Heiringhoff, Burkhard; and Krumme, Helmut, 4,320,926, Cl. 308-9.000.
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Pinck, Peter; Heitmann, Uwe; Baier, Anton; and Helms, Adolf, 4,320,773, Cl. 131-281.000.
Helms, Adolf: *See*—
Pinck, Peter; Heitmann, Uwe; Baier, Anton; and Helms, Adolf, 4,320,773, Cl. 131-281.000.
Henderson, James N.; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Polymerization process short stopped with undisproportionated rosin acid. 4,321,171, Cl. 526-84.000.
Henfrey, Basil; and Hart, Kenneth R., to AECI Limited. Injection moulding process and apparatus. 4,321,227, Cl. 264-167.000.

Henin, Jean-Pierre, to Fives-Cail Babcock. Process for high temperature phosphate ore burning. 4,321,238, Cl. 423-167.000.
Hentschel, Peter: *See*—
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,321,683, Cl. 364-561.000.
Herb, Armin; and Leibhard, Erich, to Hilti Aktiengesellschaft. Device for the melting and measured discharge of a thermoplastic adhesive. 4,320,857, Cl. 222-146.0HE.
Herbstman, Sheldon; and Dorn, Peter, to Texaco Inc. Hydrocarbyl substituted phenylaspartates of N-primary-alkyl-alkylene diamines and motor fuel composition containing same. 4,321,062, Cl. 44-71.000.
Herman Miller, Inc.: *See*—
Nagelkirk, Preston, 4,320,852, Cl. 220-331.000.
Nagelkirk, Robert A., 4,320,935, Cl. 312-350.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Chszaniecki, Siegfried, 4,320,928, Cl. 308-207.00R.
Hermecz, Istvan; Meszaros, Zoltan; Bitter, Istvan; Horvath, Agnes; and Vasvari nee Debreczy, Lelle, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Substituted-4-oxo-1,6,7,8-tetrahydro-4H-pyrido[1,2-a]pyrimidines. 4,321,377, Cl. 544-282.000.
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Herrod, Clive A.; and Campbell, James G., to Northern Engineering Industries Limited. Method of expanding tubular members. 4,320,568, Cl. 29-421.00R.
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Lindstrom, John W.; Boyd, Walter A.; and Del Rosso, Victor, 4,321,103, Cl. 156-351.000.
Hickey, John S., to General Electric Company. Discoidal winding coil structure for axial gap dynamoelectric machines. 4,321,496, Cl. 310-179.000.
Hicks, James E.: *See*—
Thibodeau, Leslie N.; Luz, David W.; and Hicks, James E., 4,321,514, Cl. 315-411.000.
Highley, Robert D. Apparatus for facilitating X-ray examinations. 4,320,749, Cl. 128-83.000.
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Hile, James L.: *See*—
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,320,924, Cl. 299-37.000.
Hill, John P.: *See*—
Touchton, James J.; and Hill, John P., 4,321,517, Cl. 318-618.000.
Hill, Michael S., to General Electric Company. Method for welding battery terminal connectors to electrode grid tabs. 4,321,455, Cl. 219-123.000.
Hill, Phillip; and Hunter, Billy D., to Coburn Optical Industries, Inc. Polisher-finer apparatus. 4,320,599, Cl. 51-58.000.
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Boehm, Georg; and Hillenbrand, Engelbert, 4,321,088, Cl. 75-59.000.
Hillmann, Kermit C.; and Holsapple, Tom H., to Chromalloy American Corporation. Vehicle with improved steering system device. 4,320,810, Cl. 180-6.300.
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Herb, Armin; and Leibhard, Erich, 4,320,857, Cl. 222-146.0HE.
Hilton, Barney W.; Lin, Robert I.; and Crnkovich, Greg, to Frito-Lay, Inc. Weighing apparatus. 4,320,658, Cl. 73-437.000.
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Ueda, Akio; Akita, Shuichi; Hirakawa, Hiroshi; and Ahagon, Asahiro, 4,321,168, Cl. 524-526.000.
Hirano, Masachika: *See*—
Suzuki, Yukio; Hirano, Masachika; and Aketa, Koichi, 4,321,212, Cl. 260-465.00D.
Hird, David L.: *See*—
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,320,924, Cl. 299-37.000.
Hirosawa, Makoto: *See*—
Saito, Isao; Hirosawa, Makoto; and Sakamoto, Seiya, 4,321,631, Cl. 358-298.000.
Hirose, Hisashi: *See*—
Miyaji, Masahiro; and Hirose, Hisashi, 4,321,509, Cl. 315-291.000.
Hirose, Koichi; and Shibata, Akira, to Hitachi, Ltd. Reproducing system for video tape recorders. 4,321,618, Cl. 358-8.000.
Hirose, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic cash issue machine. 4,320,854, Cl. 221-12.000.
Hirose, Takashi: *See*—
Fujii, Toshinobu; Hirose, Takashi; and Kondo, Naoki, 4,321,312, Cl. 429-12.000.
Hirschfield, Dean J.: *See*—
Szabo, Bela G.; and Hirschfield, Dean J., 4,320,831, Cl. 206-45.340.
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Tan, Toshimi; and Hisano, Katsukuni, 4,321,012, Cl. 416-217.000.
Hisashi, Mino; Matsukawa, Masao; and Nagashima, Minematsu, to Sanyo-Kokusaku Pulp Co., Ltd. Heat-sensitive recording material. 4,321,309, Cl. 428-522.000.
Hitachi, Ltd.: *See*—
Abe, Katsunobu; Kimura, Satoru; and Kamezawa, Norimasa, 4,321,538, Cl. 324-318.000.
Aida, Masaaki; Kobayashi, Takashi; and Saitoh, Hiroshi, 4,320,564, Cl. 29-33.00L.
Degawa, Takashi; Suginuma, Atsushi; Usui, Hideo; Kawashima, Kenichi; Kan, Tsuneo; and Takao, Kunihiko, 4,321,019, Cl. 417-269.000.
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, 4,321,079, Cl. 364-474.000.
Fujii, Tsuyoshi; and Yanagida, Isao, 4,321,009, Cl. 415-172.00R.
Hasegawa, Norio; Yamamoto, Naoki; and Yanazawa, Hiroshi, 4,321,104, Cl. 156-643.000.
Hirose, Koichi; and Shibata, Akira, 4,321,618, Cl. 358-8.000.
Imura, Ryo, 4,321,690, Cl. 365-2.000.
Ito, Genji; Tsunoo, Mitsunobu; and Fukuchi, Fumio, 4,320,674, Cl. 81-54.000.
Kagohata, Tsuneo, 4,320,797, Cl. 165-12.000.
Kanda, Hiroshi, 4,321,696, Cl. 367-157.000.
Kosugi, Hiroshi; and Imai, Kunio, 4,321,585, Cl. 340-347.0DA.
Nagasu, Akira; Yamamoto, Yosimi; Nagata, Takeo; Uchida, Hiroyasu; and Sakurai, Yutaka, 4,321,578, Cl. 338-42.000.
Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.
Sakamoto, Masakatsu; and Uchida, Kenji, 4,321,016, Cl. 417-63.000.
Seki, Kunio, 4,321,428, Cl. 179-1.00A.
Shoji, Fusaji; Takemoto, Issei; Yokono, Hitoshi; and Isogai, Tokio, 4,321,319, Cl. 430-270.000.
Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, 4,321,344, Cl. 526-64.000.
Takahashi, Junichi; and Shibata, Takanori, 4,321,677, Cl. 364-426.000.
Tan, Toshimi; and Hisano, Katsukuni, 4,321,012, Cl. 416-217.000.
Yasuda, Ken-ichi; and Shida, Shigeru, 4,320,643, Cl. 72-8.000.
Yokokawa, Hiroshi; Hattori, Chutetsu; and Takeda, Masaaki, 4,321,537, Cl. 324-312.000.
Hitachi Medical Corporation: *See*—
Tanaka, Eiichi; Tomitani, Takehiro; Takami, Katsumi; and Ishimatsu, Kenji, 4,321,474, Cl. 250-551.000.
Hitco: *See*—
Shaffer, Robert C.; and Tarasen, William L., 4,321,298, Cl. 428-242.000.
Hladun, Kenneth W., to Pyro-Sciences, Inc. Hazardous materials incineration system. 4,320,709, Cl. 110-235.000.
Ho, Chi C.; and Yang, Tai H. Television set with supervisory functions of alarming burglary and safe watching distance. 4,321,593, Cl. 340-541.000.
Ho, Pang T., to Ford Aerospace & Communications Corp. Apparatus and method for individually testing combined active elements. 4,321,527, Cl. 324-58.00A.
Hoechst Aktiengesellschaft: *See*—
Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, 4,321,245, Cl. 423-321.00S.
Scheler, Siegfried, 4,321,373, Cl. 544-159.000.
Smerz, Otto; Martini, Thomas; Billenstein, Siegfried; and Adrian, Klaus, 4,321,052, Cl. 8-107.000.
Hoechst Roussel Pharmaceuticals Inc.: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,321,385, Cl. 546-208.000.
Hoefelmayr, Tilmann; and Maier, Jakob, to Biomelktechnik Swiss Hoefelmayr & Co. Rubber teat holder. 4,320,718, Cl. 119-14.470.
Hoey, George B., to Mallinckrodt, Inc. Glycosyl triidobenzoic acid derivatives. 4,321,368, Cl. 536-119.000.
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Chan, Ka-Kong; and Pawson, Beverly A., 4,321,209, Cl. 260-408.000.
Fryer, Rodney I.; and Gilman, Norman W., 4,321,199, Cl. 260-326.00A.
Hoge, William H. Process for making ethanol and fuel product. 4,321,328, Cl. 435-165.000.
Hohne, Klaus: *See*—
Zabrocki, Karl; Dhein, Rolf; Weider, Franz; Hohne, Klaus; and Schorn, Kurt, 4,321,170, Cl. 524-285.000.
Hoi, Cheung T., to Freezinhot Bottle Co., Ltd. Torch. 4,321,657, Cl. 362-183.000.
Holekamp, Malcolm L. Dredging device. 4,320,590, Cl. 37-72.000.
Holland, William P.; and Pellegrino, Anthony, to Machlett Laboratories, Inc., The. X-Ray target monitor. 4,321,471, Cl. 250-406.000.
Hollingsworth, Richard J., to RCA Corporation. Two input sense circuit. 4,321,492, Cl. 307-530.000.
Holmes, William O. Fresh-air breathing device and method. 4,320,756, Cl. 128-206.120.
Holsapple, Tom H.: *See*—
Hillmann, Kermit C.; and Holsapple, Tom H., 4,320,810, Cl. 180-6.300.
Holub, Edward J.: *See*—
Valembois, Pierre V.; Deckert, Cheryl A.; and Holub, Edward J., 4,320,567, Cl. 29-407.000.
Holweg, Hermanus A. C.: *See*—
Kummeling, Jozef W. M.; and Holweg, Hermanus A. C., 4,320,647, Cl. 72-203.000.
Home Crafts Corporation: *See*—
GangaRao, Hota V. S., 4,320,606, Cl. 52-125.000.
Hon, Edward H., to American Home Products Corporation. Fetal electrode. 4,320,764, Cl. 128-635.000.
Honda, Akira; Kumagai, Shinobu; and Takita, Hiroyuki, to Nippon Kokan Kabushiki Kaisha. Sub-lance assembly for sampling and temperature-measuring of molten metal during refining thereof. 4,320,668, Cl. 73-863.110.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Katsuhiko; Ueda, Minoru; and Minekawa, Hiroshi, 4,320,791, Cl. 152-362.00R.
Ohmori, Taiji; and Sato, Makoto, 4,321,676, Cl. 364-426.000.
Honda, Satoru, to Pioneer Electronic Corporation. Tape recorder control system. 4,321,515, Cl. 318-6.000.
Honegger, Werner: *See*—
Reist, Walter; and Honegger, Werner, 4,320,894, Cl. 271-277.000.
Honeywell Inc.: *See*—
Boler, Clifford H.; and Wilwerding, Dennis J., 4,321,486, Cl. 307-311.000.
Miles, Gregory M., 4,321,480, Cl. 307-117.000.
Payne, Robert L.; and Reinke, Thomas R., 4,321,561, Cl. 331-111.000.
Honeywell Information Systems Inc.: *See*—
Flynn, Richard T.; and Kindell, Jerry L., 4,321,668, Cl. 364-200.000.
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.
Hoogen, Karl-Heinz: *See*—
Reichel, Hilmar; and Hoogen, Karl-Heinz, 4,321,528, Cl. 324-77.00D.
Hooker, Ross B., III; and Routt, Wilson M., Jr., to International Business Machines Corporation. Optical scanner for ink jet printer. 4,321,627, Cl. 358-286.000.
Hori, Takanobu; and Yoshida, Motoharu, to Aisin Seiki Kabushiki Kaisha. Fan assembly. 4,321,011, Cl. 416-214.00R.
Horna, Otakar A., to Communications Satellite Corporation. Correction processor of self-adaptive filters. 4,321,686, Cl. 364-724.000.
Horner, Jerome T.: *See*—
Blakeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., 4,321,229, Cl. 264-349.000.
Horvath, Agnes: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Bitter, Istvan; Horvath, Agnes; and Vasvari nee Debreczy, Lelle, 4,321,377, Cl. 544-282.000.
Horwath, Robert O.: *See*—
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Maselli, John A.; and Horwath, Robert O., 4,321,324, Cl. 435-105.000.
Hosking, Rodger H.: *See*—
Bertrand, John; Flink, Joseph H.; Shamah, Daniel; and Hosking, Rodger H., 4,321,680, Cl. 364-485.000.
Hosoe, Kazuya; Tsunekawa, Tokuichi; Masunaga, Makoto; and Sakane, Toshio, to Canon Kabushiki Kaisha. Motion detecting device in exposure control system for optical instrument. 4,320,948, Cl. 354-31.000.
Hosogai, Setsuo: *See*—
Fujiwara, Kouhei; and Hosogai, Setsuo, 4,321,440, Cl. 200-153.00G.
Howk, Max E.; Slentz, Gale E.; and Grillot, Ronald E., to King Radio Corporation. Universal frequency synthesizer. 4,321,555, Cl. 331-1.00A.
Hoy, Leslie R. J.; and Westgate, Peter S., to Imperial Chemical Industries Limited. Production of aqueous dispersion of aromatic polyethersulphone. 4,321,174, Cl. 523-101.000.
Huber, Adalbert, to UHDE GmbH. Process for producing fully desalted process water. 4,321,144, Cl. 210-661.000.
Huber, Paul G.: *See*—
Adler, Michael S.; and Huber, Paul G., 4,321,508, Cl. 315-291.000.
Huffaker, E. Max: *See*—
Maloney, Thomas M.; and Huffaker, E. Max, 4,320,715, Cl. 118-303.000.
Hughes Aircraft Company: *See*—
Ajioka, James S., 4,321,604, Cl. 343-753.000.
Blair, George R., 4,321,073, Cl. 65-3.310.
Evtuhov, Viktor, 4,321,550, Cl. 330-4.300.
Hughes, Brian T.; Vokes, John C.; and Wight, David R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Field effect devices and their fabrication. 4,321,613, Cl. 357-22.000.
Hughes, Larry M., to RCA Corporation. Carriage reset apparatus for disc record player. 4,321,702, Cl. 369-77.000.
Hummel, Klaus: *See*—
Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,321,268, Cl. 424-266.000.
Humphrey, Geoffrey J., to Westland Aircraft Limited. Freewheel coupling. 4,320,633, Cl. 64-25.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,321,369, Cl. 542-415.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Process for recovering film from pressurized extrusion zone. 4,321,230, Cl. 264-556.000.
Hunter, Andrew F., to Conoco Inc. Tension leg platform mooring tether connector. 4,320,993, Cl. 405-224.000.
Hunter, Billy D.: *See*—
Hill, Phillip; and Hunter, Billy D., 4,320,599, Cl. 51-58.000.
Hurt, Frank K. Pump assembly driven by an endless conveyer. 4,321,018, Cl. 417-229.000.
Husler, Rinaldo: *See*—
Felder, Louis; Kirchmayr, Rudolf; and Husler, Rinaldo, 4,321,118, Cl. 204-159.180.
Huttlin, Herbert. Fluidized bed apparatus. 4,320,584, Cl. 34-57.00A.
Huykman, Richard B., to Reliance Electric Company. Common mode rejection coupler. 4,321,487, Cl. 307-311.000.
Hvizdos, Leonard J., to Air Products and Chemicals, Inc. Apparatus for recovering natural gas in a mine. 4,320,627, Cl. 62-54.000.
Ichiko Industries Limited: *See*—
Tamura, Takeo; and Nakamura, Tatuo, 4,320,554, Cl. 15-250.00B.
ICI Americas Inc.: *See*—
Johnson, Joseph L., III, 4,320,657, Cl. 73-432.00R.
Ido, Tadashi: *See*—
Yamashita, Youhachi; Yokoyama, Katsunori; Ido, Tadashi; and Yoshida, Seiichi, 4,321,155, Cl. 252-62.900.
Igarashi, Hatsuhide, to Nippon Electric Co., Ltd. Crystal oscillator circuit capable of changing the number of inverter stages coupled in series. 4,321,562, Cl. 331-116.0FE.
Iijima, Takashi: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,321,123, Cl. 204-195.00B.
Ikeda, Hiroshi; and Takeuchi, Koji, to Minolta Camera Kabushiki Kaisha. Drive mechanism for an image transfer type copying apparatus. 4,320,954, Cl. 355-3.00R.
Ikegami, Shiro: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,321,273, Cl. 424-287.000.
Ilk, Emil; and Sorg, Helmut. Skimming apparatus. 4,321,075, Cl. 65-27.000.
Illinois Tool Works Inc.: *See*—
Speedie, Robert, 4,320,557, Cl. 17-1.00R.
Imai, Kunio: *See*—
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Imaizumi, Hiroyuki: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,321,265, Cl. 424-246.000.
Imaoka, Yasuo: *See*—
Morita, Haruyuki; Kubota, Yuichi; and Imaoka, Yasuo, 4,321,303, Cl. 428-404.000.
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, to Fujitsu Fanuc Limited. Reference voltage generating circuit in a DC power supply. 4,321,525, Cl. 323-281.000.
Imbert, Thierry F.: *See*—
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,321,378, Cl. 544-321.000.
Imperial Chemical Industries Limited: *See*—
Bowler, Jean; and Crossley, Neville S., 4,321,275, Cl. 424-317.000.
Heasman, Peter J. R., 4,320,990, Cl. 405-66.000.
Hoy, Leslie R. J.; and Westgate, Peter S., 4,321,174, Cl. 523-101.000.
Imura, Ryo, to Hitachi, Ltd. Magnetic bubble memory module. 4,321,690, Cl. 365-2.000.
Inaba, Naomi: *See*—
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,321,346, Cl. 526-142.000.
Industrie Pirelli S.p.A.: *See*—
Tangorra, Giorgio; and Cappa, Giulio, 4,321,049, Cl. 474-242.000.
Infra-Red Engineering Ltd.: *See*—
Edgar, Roger F., 4,320,967, Cl. 356-51.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Mia, Gian V.; and Figini, Mario, 4,320,980, Cl. 400-70.000.
Ingersoll-Rand Company: *See*—
Luthi, Oscar, 4,321,140, Cl. 210-327.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,321,450, Cl. 219-69.00M.
Inoue, Kiyoshi, 4,321,451, Cl. 219-69.00G.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electrical discharge machining with a vibrating wire electrode. 4,321,450, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Servo system and method for controlling the gap spacing between a tool and workpiece electrodes in an EDM machine. 4,321,451, Cl. 219-69.00G.
Inoue, Takemi: *See*—
Nishida, Hiroshi; Nakamizo, Keiichi; Inoue, Takemi; and Miyazaki, Takeshi, 4,320,713, Cl. 114-123.000.
Inoue, Yukio: *See*—
Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, 4,321,344, Cl. 526-64.000.
Institut National de la Sante et de la Recherche Medicale - I.N.S.E.R.M.: *See*—
Cathignol, Dominique; Fourcade, Claude; and Chapelon, Jean-Yves, 4,320,765, Cl. 128-663.000.
Institut Straumann AG: *See*—
Sutter, Franz, 4,320,875, Cl. 239-462.000.
Instrumentarium Oy: *See*—
Alihanka, Jukka; Vaahtoranta, Kaarle; and Bjorkqvist, Stig-Eyrik, 4,320,766, Cl. 128-671.000.
International Business Machines Corporation: *See*—
Anderson, Howard W.; and Levin, Ronald H., 4,321,318, Cl. 430-59.000.
Blaser, Eugene M., 4,321,484, Cl. 307-273.000.
Brown, Leon C.; and Pond, Stanley L., 4,320,957, Cl. 355-3.0CH.
Heibein, Harry P.; and Tsao, Chein-Hwa S., 4,321,607, Cl. 346-75.000.
Hooker, Ross B., III; and Routt, Wilson M., Jr., 4,321,627, Cl. 358-286.000.
Parsons, Raymond L.; and Paulsen, Paul H., 4,321,687, Cl. 364-900.000.
Robbins, Wayne E.; Spivey, Paul R.; and Travis, Terence, 4,321,667, Cl. 364-200.000.

Scott, Michael A.; and Brown, Albert E., 4,321,286, Cl. 427-152.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,321,255, Cl. 424-49.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,320,771, Cl. 131-276.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,321,164, Cl. 252-522.00R.
Yoshida, Takao, 4,320,772, Cl. 131-276.000.
International Rectifier Corporation: *See*—
Hauck, James H., 4,320,571, Cl. 29-591.000.
International Vacuum, Inc.: *See*—
Terai, Kiyohide; and Mackertich, George, 4,321,453, Cl. 219-121.0ED.
Interox: *See*—
Brichard, Jean; and Colery, Jean-Claude, 4,321,301, Cl. 428-403.000.
Ionics Incorporated: *See*—
Jain, Surendar M., 4,321,192, Cl. 260-122.000.
Iowa Beef Processors, Inc.: *See*—
Couture, William F., 4,320,559, Cl. 17-50.000.
Ipco Corporation: *See*—
Miller, Alan; Schweizer, Edward E.; and Campanello, John, 4,321,040, Cl. 433-102.000.
Weissman, Bernard, 4,321,036, Cl. 433-74.000.
Irie, Hideyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electro-acoustic transducer. 4,321,434, Cl. 179-181.00R.
Isenhardt, Friedel: *See*—
Edel, Wilhelm; Heindl, Reinhold; Isenhardt, Friedel; and Schultze-Rhonhof, Ernst, 4,321,457, Cl. 219-497.000.
Ishida, Masato; Maeshima, Katsuyoshi; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image formation apparatus. 4,320,964, Cl. 355-69.000.
Ishida, Yukihito: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,321,273, Cl. 424-287.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, 4,321,388, Cl. 546-291.000.
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, to Sato, Ryuichi. Germanium-containing organic polymer and its use in the treatment of pulmonary fibrosis. 4,321,273, Cl. 424-287.000.
Ishikawa, Keizo: *See*—
Tada, Hiroshi; Abe, Wataru; Nozu, Toshiro; and Ishikawa, Keizo, 4,320,548, Cl. 14-1.000.
Ishikawa, Masakazu; Ohori, Harumi; and Kiriyama, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Check mechanism for fluid level warning device in fluid reservoirs. 4,321,590, Cl. 340-515.000.
Ishikawa, Noboru: *See*—
Arimoto, Shunji; Shoji, Akio; Takezawa, Shoichiro; Ishikawa, Noboru; and Takeda, Hirofumi, 4,321,335, Cl. 525-116.000.
Ishikawa, Youhei: *See*—
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Tsuji, Shoichi; Aoki, Kiyoshi; and Asai, Minoru, 4,321,233, Cl. 422-142.000.
Ishimatsu, Kenji: *See*—
Tanaka, Eiichi; Tomitani, Takehiro; Takami, Katsumi; and Ishimatsu, Kenji, 4,321,474, Cl. 250-551.000.
Isogai, Tokio: *See*—
Shoji, Fusaji; Takemoto, Issei; Yokono, Hitoshi; and Isogai, Tokio, 4,321,319, Cl. 430-270.000.
Isotec Industries Limited: *See*—
Mallory, John; and Turlej, Zbignew W., 4,321,466, Cl. 250-574.000.
Itatani, Ryohei: *See*—
Tsuchihashi, Michihiro; Itatani, Ryohei; Ryohko, Masatoshi; and Murai, Yutaka, 4,321,506, Cl. 315-35.000.
Ito, Genji; Tsunoo, Mitsunobu; and Fukuchi, Fumio, to Hitachi, Ltd. Screw fastening apparatus. 4,320,674, Cl. 81-54.000.
Ito, Mikio: *See*—
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,320,971, Cl. 356-328.000.
Ito, Tetsuro: *See*—
Harigane, Kotaro; and Ito, Tetsuro, 4,320,574, Cl. 29-741.000.
Ito, Yoichiro, to United States of America, Health and Human Services. Method and apparatus for preparative countercurrent chromatography employing a rotating column assembly. 4,321,138, Cl. 210-198.200.
Ito, Yoji: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,321,560, Cl. 331-99.000.
Itoh, Tsutomu, to Onoda Cement Co., Ltd. Process for electrostatic coating with pulverized material and apparatus used in said process. 4,321,281, Cl. 427-33.000.
Itou, Eiji: *See*—
Takiguchi, Daigaku; Itou, Eiji; Nakamura, Hiroaki; and Kumita, Izumi, 4,321,363, Cl. 536-18.000.
Iwai, Fumio: *See*—
Seimiya, Ryubun; Shinozaki, Akira; Nosaka, Isao; and Iwai, Fumio, 4,320,952, Cl. 355-3.0SH.
Izawa, Fumio: *See*—
Yamashita, Hiroshi; Izawa, Fumio; and Yanagida, Seiichi, 4,321,637, Cl. 360-93.000.
Izumi, Hideaki: *See*—
Murata, Eiji; Izumi, Hideaki; Sugawara, Atuko; and Okano, Susumu, 4,321,612, Cl. 357-15.000.
J. A. Masterson & Company: *See*—
Meldahl, Robert D.; and Borel, Robert J., 4,320,822, Cl. 192-18.00R.
J. C. Kinley Company: *See*—
Kinley, John C.; Dieckman, Harry E.; and Anderson, Clifford E., 4,320,579, Cl. 33-178.00R.
J. I. Case Company: *See*—
Marto, John H., 4,320,616, Cl. 56-15.300.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Industrial technique. 4,321,111, Cl. 376-353.000.
Jacquet, Bernard; Papantoniou, Christos; Vanlerberghe, Guy; and Mondet, Jean, to L'Oreal. Copolymers of N-vinyl pyrrolidone and a vinylic, allylic or methallylic ester of a cyclic α- or β-carboxylic acid; and cosmetic compositions containing the same. 4,321,348, Cl. 526-218.000.
Jahnke, Richard W., to Lubrizol Corporation, The. Metal workpieces coated with ester-based hot melt metal working lubricants. 4,321,308, Cl. 428-469.000.
Jain, Surendar M., to Ionics Incorporated. Fractionation of protein mixtures by salt addition followed by dialysis treatment. 4,321,192, Cl. 260-122.000.
Jan, David K.: *See*—
Dennison, William T.; and Jan, David K., 4,321,007, Cl. 415-142.000.
Japan Atomic Energy Research Institute: *See*—
Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, 4,321,117, Cl. 204-159.160.
Japan Synthetic Rubber Co., Ltd.: *See*—
Yoshida, Yoshinori; and Shinohara, Hironobu, 4,321,409, Cl. 560-244.000.
Jeanneret, Rene: *See*—
Cuche, Claude; Jeanneret, Rene; and Niederhauser, Michel, 4,320,635, Cl. 66-220.000.
Jeenicke, Edmund; Klotzner, Winfried; and Dilger, Peter, to Robert Bosch GmbH. Frequency-voltage and voltage-frequency converters. 4,321,548, Cl. 328-143.000.
Jeffries, Ernest H., Jr., to Resco Products, Inc. End block. 4,320,612, Cl. 52-396.000.
Jelinek, Jerry G., to Parker-Hannifin Corporation. Method for making a hatch cover with a seal. 4,321,225, Cl. 264-138.000.
Jenner, Michael D.: *See*—
Blackman, Maurice V.; and Jenner, Michael D., 4,321,615, Cl. 357-30.000.
Jenoptik Jena G.m.b.H.: *See*—
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,321,683, Cl. 364-561.000.
Jensen, Per J. T., to A/S Hellesens. Alkaline battery. 4,321,315, Cl. 429-152.000.
Jerome, Jonathan A.; Neu, Frank D.; and Faraghan, Geoffrey T., to McDonnell Douglas Corporation. Video track transfer system and method. 4,321,622, Cl. 358-128.500.
Jochmann, Franz; Fischer, Helmut; Dietz, Wolfgang; and Bauernfeind, Olaf, to Bayerische Motoren Werke Aktiengesellschaft. Circuit arrangement for monitoring operating functions in motor vehicles. 4,321,579, Cl. 340-52.00F.
Johanning, Gary L.; Muhrer, Merle E.; and Gaddy, Herschel J., to University of Missouri, The Curators of the. Animal feedstuffs and process. 4,321,278, Cl. 426-69.000.
John B. Pike & Son, Inc.: *See*—
Dobbin, Robert R., 4,321,096, Cl. 134-8.000.
John Fluke Mfg. Co., Inc.: *See*—
Craft, Kingsley W., 4,321,706, Cl. 375-59.000.
Johnson Controls, Inc.: *See*—
Matthews, Russell B., 4,321,030, Cl. 431-20.000.
Johnson & Johnson: *See*—
Sipos, Tibor, 4,321,257, Cl. 424-80.000.
Johnson & Johnson Products, Inc.: *See*—
Dabroski, Winifred C., 4,320,750, Cl. 128-91.00R.
Johnson, Joseph L., III, to ICI Americas Inc. Particulate flowmeter. 4,320,657, Cl. 73-432.00R.
Johnson, Leo F., to Bell Telephone Laboratories, Incorporated. Surface gratings and a method of increasing their spatial frequency. 4,321,282, Cl. 427-38.000.
Johnson, Lewis T.: *See*—
Carroll, James C.; and Johnson, Lewis T., 4,320,837, Cl. 206-505.000.
Johnson, Philip A.; and McCarthy, Alfred F., to Aavid Engineering, Inc. Heat sink fastenings. 4,321,423, Cl. 174-16.0rIS.
Johnson, Ralph E., to Singer Company, The. Thread handling. 4,320,712, Cl. 112-184.000.
Johnson, Virgil. Heating stove. 4,320,738, Cl. 126-77.000.
Jones, Stella S.; Ogston, Christine B.; and Webb, Robert L., to Smith-Kline Corporation. Preparation of 2-thiophenecarbonyl chloride. 4,321,399, Cl. 549-70.000.
Joyal, Francis G.; and Ren, Chung-Li, to Bell Telephone Laboratories, Incorporated. Waveguide filter employing common phase plane coupling. 4,321,568, Cl. 333-209.000.
Juhasz, Daniel P.: *See*—
Abbott, Roderick K.; Seneviratne, Padmasiri D.; and Juhasz, Daniel P., 4,320,915, Cl. 294-96.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,320,934, Cl. 312-331.000.
K/W/D Associates: *See*—
Walter, David E., Jr.; and Kolmes, Max G., 4,321,461, Cl. 235-92.0FL.
Kabushiki Kaisha Akashi Seisakusho: *See*—
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Kabushiki Kaisha Daini Seikosha: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,519, Cl. 318-696.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,520, Cl. 318-696.000.
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Kabushiki Kaisha Suwa Seikosha: *See*—
Gomi, Tsuguo; and Takeda, Osamu, 4,321,698, Cl. 368-202.000.
Kadin, Saul B., to Pfizer Inc. Antiulcer thiazol-2-ylcarbamoyl-carboxylic acids, esters and amides. 4,321,372, Cl. 544-133.000.
Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, to Japan Atomic Energy Research Institute. Process for preparing a polymer composition. 4,321,117, Cl. 204-159.160.
Kagohata, Tsuneo, to Hitachi, Ltd. Control apparatus for air conditioner of automobile. 4,320,797, Cl. 165-12.000.
Kai, Yoshinori; and Pryde, Everett H., to United States of America, Agriculture. Conversion of cyclopropenoids to conjugated diene and saturated derivatives. 4,321,210, Cl. 260-409.000.
Kajima Corporation: *See*—
Shiozawa, Kaoru; and Matsunaga, Tsunebumi, 4,321,448, Cl. 219-57.000.
Kakeno, Sadao, to Ricoh Company, Ltd. Deflection plate array. 4,321,608, Cl. 346-75.000.
Kalenik, Stephen P.: *See*—
Eburn, William H., Jr.; and Kalenik, Stephen P., 4,321,014, Cl. 417-5.000.
Kamath, Bantval Y., to Ampex Corporation. Second order velocity error correction for time base correctors. 4,321,619, Cl. 358-8.000.
Kamen, Melvin E.: *See*—
Levine, Sol; Kamen, Melvin E.; DeFazio, August; and Cueli, Peter, 4,321,087, Cl. 75-0.50A.
Kamezawa, Norimasa: *See*—
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Kammermaier, Johann; Mueller, Rudiger; and Roedl, Peter, to Siemens Aktiengesellschaft. Quantity of flow meter. 4,320,655, Cl. 73-204.000.
Kampe, Wolfgang: *See*—
Bosies, Elmar; Berger, Herbert; Kampe, Wolfgang; Bicker, Uwe; and Grafe, Alfred, 4,321,194, Cl. 260-239.00E.
Kan, Tsuneo: *See*—
Degawa, Takashi; Suginuma, Atsushi; Usui, Hideo; Kawashima, Kenichi; Kan, Tsuneo; and Takao, Kunihiko, 4,321,019, Cl. 417-269.000.
Kanda, Hiroshi, to Hitachi, Ltd. Ultrasonic transducer using ultra high frequency. 4,321,696, Cl. 367-157.000.
Kannchen, Werner: *See*—
Panek, Peter; Woditsch, Peter; and Kannchen, Werner, 4,321,237, Cl. 423-82.000.
Kaplan, Daniel; Sol, Nicole; and Landouar, Pierre, to Thomson-CSF. Process for producing a layer containing silicon and photoelectric conversion device utilizing this process. 4,321,420, Cl. 136-255.000.
Kaplan, Daniel: *See*—
Boulanger, Philippe; Kaplan, Daniel; and Mourier, Georges, 4,320,716, Cl. 118-723.000.
Kaplan, Leonard A., to RCA Corporation. Over-current protection circuits for power transistors. 4,321,648, Cl. 361-101.000.
Kaplan, Michael; Poliniak, Eugene S.; and Meyerhofer, Dietrich, to RCA Corporation. Electron flood exposure apparatus. 4,321,470, Cl. 250-398.000.
Karlsson, Lars H. Apparatus for manufacturing candles. 4,320,575, Cl. 29-788.000.
Kasuga, Masao; Satoh, Masaki; and Matsushige, Takashi. Circuit for reducing the limit cycle in a digital filter. 4,321,685, Cl. 364-724.000.
Kasuga, Muneo: *See*—
Nishikawa, Masaji; Kasuga, Muneo; and Funakubo, Tomoki, 4,320,956, Cl. 355-3.0CH.
Kataoka, Yoshiro: *See*—
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Kato, Toshikazu: *See*—
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.
Katoh, Masayoshi: *See*—
Nakamori, Takashi; Matsumoto, Zensho; Matsushita, Kiyomi; Katoh, Masayoshi; and Matsuoka, Hideoki, 4,320,909, Cl. 280-752.000.
Kaufman, Donald L., to Alside, Inc. Profiled insulating underboard. 4,320,613, Cl. 52-521.000.
Kawaguchi, Masayuki: *See*—
Takahashi, Kotei; Endo, Teruo; and Kawaguchi, Masayuki, 4,320,824, Cl. 192-115.000.
Kawai, Tohru, to Canon Kabushiki Kaisha. Extension tube for camera. 4,320,951, Cl. 354-286.000.
Kawamoto, Akira: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,320,629, Cl. 62-198.000.
Kawamoto, Tamio, to Nissan Motor Co., Ltd. Shift interlock mechanism of a vehicle power transmission. 4,320,670, Cl. 74-477.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishida, Hiroshi; Nakamizo, Keiichi; Inoue, Takemi; and Miyazaki, Takeshi, 4,320,713, Cl. 114-123.000.
Takada, Toshiyuki; Tamba, Shinichi; and Yamamoto, Hitoshi, 4,320,724, Cl. 123-73.0AD.
Kawashima, Kenichi: *See*—
Degawa, Takashi; Suginuma, Atsushi; Usui, Hideo; Kawashima, Kenichi; Kan, Tsuneo; and Takao, Kunihiko, 4,321,019, Cl. 417-269.000.
Kawazoe, Michio. Coupling device. 4,320,885, Cl. 248-222.100.
Kay, David B., to Xerox Corporation. Copy reproduction apparatus. 4,320,955, Cl. 355-3.00R.
Kayaba Kogyo Kabushiki Kaisha: *See*—
Komiya, Morio, 4,320,692, Cl. 91-497.000.
Keeffe, William M.; Rothwell, Harold L., Jr.; and Scholz, John A., to GTE Products Corporation. Low wattage metal halide arc discharge lamp. 4,321,504, Cl. 313-214.000.
Keeffe, William M.: *See*—
English, George J.; Rothwell, Harold L., Jr.; and Keeffe, William M., 4,321,501, Cl. 313-197.000.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing ester derivatives of estradiol. 4,321,252, Cl. 424-28.000.
Kelley, Robert J. Nestable casket. 4,320,562, Cl. 27-2.000.
Kelly, Austin T.; Emile, Philip, Jr.; and Stolpen, Alan H., to Sangamo Weston, Inc. Multimeter with tone indication. 4,321,530, Cl. 324-115.000.
Kendall Company, The: *See*—
Arkans, Edward J.; and Villari, Frank K., 4,320,746, Cl. 128-24.00R.
Kennedy, Paul L., to Veeder Industries, Inc. Rotary pulse generator. 4,321,495, Cl. 310-156.000.
Kermer, Wolf-Dieter: *See*—
Hansen, Guenter; Kermer, Wolf-Dieter; and Kolbinger, Hans J., 4,321,055, Cl. 8-639.000.
Kernforschungsanlage Julich GmbH: *See*—
Nickel, Manfred; and Escherich, Karl H., 4,321,110, Cl. 376-250.000.
Kerr-McGee Chemical Corporation: *See*—
Stambaugh, Edgel P.; and Neuendorf, David W., 4,321,236, Cl. 423-82.000.
Kerr, Russell H., to Deere & Company. Blade fabricating process. 4,321,097, Cl. 148-12.400.
Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Injection moldable amide-imide polymers containing divalent aliphatic radicals derived from aliphatic diamines. 4,321,357, Cl. 528-350.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,321,252, Cl. 424-28.000.
Khurges, Evgeny M.: *See*—
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.
Kice, James D.: *See*—
Glassman, Stephen M.; Kice, James D.; and Ryding, Paul A., 4,320,722, Cl. 119-96.000.
Kidwell, Carl. Cymbal. 4,320,687, Cl. 84-402.000.
Kieferle, Wolfgang; and Waschle, Franz, to Kieferle, Wolfgang. Process for forming a metal or alloy layer on an electricity-conducting work piece and device for executing same. 4,321,126, Cl. 204-298.000.
Kiekert GmbH & Co. Kommanditgesellschaft: *See*—
Kleefeldt, Frank; and Brackmann, Horst, 4,320,639, Cl. 70-364.00R.
Kikuta, Kazutsune: *See*—
Sato, Akihiro; Tachibana, Masami; and Kikuta, Kazutsune, 4,321,345, Cl. 526-115.000.
Kim, Kyong: *See*—
Krames, Lester; and Kim, Kyong, 4,321,674, Cl. 364-413.000.
Kimura, Kaora; and Sugiura, Kyoji, to Toagosei Chemical Industry Co., Ltd. Adhesive composition. 4,321,180, Cl. 524-549.000.
Kimura, Kenji: *See*—
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.
Kimura, Makoto, to Nippon Kogaku K.K. Apparatus for driving submirror in single lens reflex camera. 4,320,945, Cl. 354-23.00R.
Kimura, Satoru: *See*—
Abe, Katsunobu; Kimura, Satoru; and Kamezawa, Norimasa, 4,321,538, Cl. 324-318.000.
Kimura, Takashi, to Kabushiki Kaisha Akashi Seisakusho. Method and apparatus for correcting astigmatism in scanning electron microscopes and similar equipment. 4,321,468, Cl. 250-307.000.
Kimura, Yoshikazu; Tanabe, Kenziro; and Yonehara, Hiroyuki, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic masking device for use in a printer. 4,320,965, Cl. 355-74.000.
Kimzey, Paul W.; and Hanna, John L., to Tennant Company. Surface maintenance equipment. 4,320,556, Cl. 15-347.000.
Kindell, Jerry L.: *See*—
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King, Folly F.: *See—*
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King, Frederick N. Detection system for emergency vehicles with signal preemption means. 4,321,589, Cl. 340-38.00L.
King, Frederick T. Waterproof helmet encasing electronic components. 4,321,433, Cl. 179-156.00R.
King, John M.: *See—*
Fodor, Eben V.; King, John M.; and King, Folly F., 4,320,744, Cl. 126-450.000.
King Radio Corporation: *See—*
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King, Richard L.: *See—*
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.
Kinjo, Hisao; and Ozawa, Keiji, to Victor Company of Japan, Ltd. High density recording system using side-by-side information and servo tracks. 4,321,621, Cl. 358-128.600.
Kinley, John C.; Dieckman, Harry E.; and Anderson, Clifford E., to J. C. Kinley Company. Calipering tool. 4,320,579, Cl. 33-178.00R.
Kipp, Ronald W., to RCA Corporation. Frequency-tracking filter, as for use in FM-CW radar. 4,321,602, Cl. 343-14.000.
Kirchmayr, Rudolf: *See—*
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Kiriyama, Takashi: *See—*
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Kirsch, John M. Fishing device. 4,320,592, Cl. 43-43.130.
Kirschen, Solomon. Roof construction. 4,320,603, Cl. 52-18.000.
Kita, Jean-Claude: *See—*
Brice, Henri; Puff, Roger M.; and Kita, Jean-Claude, 4,321,032, Cl. 432-14.000.
Kita, Toru, to Nissan Motor Company, Limited. Flow rate measuring apparatus having vortex-generating element and hot wire element. 4,320,650, Cl. 73-3.000.
Kiwala, Jacob: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,320,771, Cl. 131-276.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,321,164, Cl. 252-522.00R.
Kleefeldt, Frank; and Brackmann, Horst, to Kiekert GmbH & Co. Kommanditgesellschaft. Drivers door lock for vehicular antitheft lock system. 4,320,639, Cl. 70-364.00R.
Klein, Andrew: *See—*
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Klein, Dieter: *See—*
Gesser, Gernot; Hauer, Franz; Racky, Berthold; and Klein, Dieter, 4,320,847, Cl. 220-67.000.
Klein, Joseph T.: *See—*
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,321,385, Cl. 546-208.000.
Klein, Robert R.; and Makowski, Henry S., to Exxon Research & Engineering Co. Process for forming a powdered sulfonated EPDM terpolymer (C-951). 4,321,340, Cl. 525-344.000.
Kleinemas, Harald, to Optimas Bauelemente und Baugerate GmbH. Apparatus for multiple setting of concrete paving blocks. 4,320,985, Cl. 404-99.000.
Kleinschmit, Peter: *See—*
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Klimenko, Vladimir I.: *See—*
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Kline, Jan C.: *See—*
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Klippstein, Karl H.; Sawdai, Joseph; Schacht, Charles A.; and Schilling, Charles G., to United States Steel Corporation. Yankee Dryer and method of fabrication. 4,320,582, Cl. 34-39.000.
Klockner-Humboldt-Deutz Ag: *See—*
Edel, Wilhelm; Heindl, Reinhold; Isenhardt, Friedel; and Schultze-Rhonhof, Ernst, 4,321,457, Cl. 219-497.000.
Klose, Hans J.: *See—*
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Klotzner, Winfried: *See—*
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Kluger, Edward W.; and Su, Tien K., to Milliken Research Corporation. Polycycloaliphatic polyamines. 4,321,353, Cl. 528-120.000.
Kluger, Edward W.; Su, Tien-Kuei; and Thompson, Teresa J., to Milliken Research Corporation. Polyamine substituted cycloaliphatic compounds. 4,321,354, Cl. 528-122.000.
Kluttermann, Jurgen: *See—*
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Knapp, Donald E.: *See—*
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Knight, Peter R., to RCA Corporation. Television receiver high voltage protection circuit. 4,321,513, Cl. 315-411.000.
Knoche, Raymond E., to Bohn & Dawson. Wheelchair brake assembly. 4,320,818, Cl. 188-2.00F.
Knogo Corporation: *See—*
Cooper, Michael N.; and Pokalsky, Peter A., 4,321,586, Cl. 340-572.000.
Knoke, Silas J.; and Stamper, James F., to Lear Siegler, Inc. Combined chair and stool apparatus. 4,320,817, Cl. 182-126.000.
Knothe, Erich; and Blawert, Dieter, to Sartorius GmbH. Weighing machine with explosion proof case. 4,320,809, Cl. 177-243.000.
Knox, Carleton R. Surfboard. 4,320,546, Cl. 441-74.000.
Knox, Lloyd C.: *See—*
Baldridge, Morris G.; Knox, Lloyd C.; and Sullaway, Bob L., 4,320,992, Cl. 405-223.000.
Kobayashi, Kimimasa: *See—*
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Kobayashi, Takashi: *See—*
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Kobayashi, Yawara: *See—*
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Koch, Melvin R.: *See—*
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Koch, Willard; and Koch, Melvin R. Grain delivery attachment for tailgate. 4,320,860, Cl. 222-502.000.
Kockelmans, Henricus G. J. M.: *See—*
Franssen, Nico V.; Van Maanen, Gerardus A.; and Kockelmans, Henricus G. J. M., 4,321,552, Cl. 330-81.000.
Kocks Technik GmbH & Co.: *See—*
Bindernagel, Ali; Blos, Ernst O.; and Brauer, Hans, 4,320,646, Cl. 72-201.000.
Kodama, Yutaka: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,321,265, Cl. 424-246.000.
Kogyo Kabushiki Kaisha: *See—*
Harigane, Kotaro; and Ito, Tetsuro, 4,320,574, Cl. 29-741.000.
Kohler, Wolf-Ulrich, to Maschinenfabrik Buckau R. Wolf AG. Apparatus for processing liquids such as water and the like by reverse osmosis. 4,321,137, Cl. 210-137.000.
Kohlert, Rudolf; and Fischer, David. Mandrel for the coaxial external machining of workpieces with internal toothing. 4,320,675, Cl. 82-43.000.
Kokusai Denshin Denwa Co., Ltd.: *See—*
Wakabayashi, Hiroharu; and Tokiwa, Hideharu, 4,320,968, Cl. 356-73.100.
Kolbinger, Hans J.: *See—*
Hansen, Guenter; Kermer, Wolf-Dieter; and Kolbinger, Hans J., 4,321,055, Cl. 8-639.000.
Kolimorgen Technologies Corporation: *See—*
Gupta, Umesh C., 4,321,499, Cl. 310-268.000.
Kolmes, Max G.: *See—*
Walter, David E., Jr.; and Kolmes, Max G., 4,321,461, Cl. 235-92.0FL.
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., to Deutsche Gardner-Denver G.m.b.H. Power tool, in particular a hand-held compressed air screw driver. 4,320,806, Cl. 173-12.000.
Kolyada, Vladimir A.: *See—*
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P., 4,321,125, Cl. 204-273.000.
Komine, Yoshio, to Canon Kabushiki Kaisha. Camera with automatic focusing device. 4,320,947, Cl. 354-25.000.
Komiya, Morio, to Kayaba Kogyo Kabushiki Kaisha. Radial cylinder hydraulic motor. 4,320,692, Cl. 91-497.000.
Kondo, Naoki: *See—*
Fujii, Toshinobu; Hirose, Takashi; and Kondo, Naoki, 4,321,312, Cl. 429-12.000.
Konishi, Hiroyuki; Hashimoto, Shunichi; and Oshio, Hiromichi, to Sumitomo Chemical Company, Limited. Ortho-(trifluoromethylsulfonamido)benzamides as herbicides. 4,321,081, Cl. 71-88.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Seimiya, Ryubun; Shinozaki, Akira; Nosaka, Isao; and Iwai, Fumio, 4,320,952, Cl. 355-3.0SH.
Konrad, Eugen; and Mager, Herbert, to Wella Aktiengesellschaft. Hair dyeing composition and process. 4,321,053, Cl. 8-407.000.
Kores Holding Zug AG: *See—*
Cespon, Manuel, 4,321,092, Cl. 106-21.000.
Korting, Reinhard, to Krupp Polysius AG. Rotary drum. 4,320,586, Cl. 34-108.000.
Koshikawa, Yukio, to Senbokuya, Mitsuaki. Method of and system for tracing monochromatically contrasting pattern. 4,321,682, Cl. 364-520.000.
Kosswig, Kurt: *See—*
Coenen, Alfred; Kosswig, Kurt; Praun, Ferdinand v.; and Regner, Hans, 4,321,247, Cl. 423-424.000.
Kosugi, Hiroshi; and Imai, Kunio, to Hitachi, Ltd. Interpolative digital-to-analog converter for linear PCM code. 4,321,585, Cl. 340-347.0DA.

Koszewa, Bernhard; and Thomas, Arthur L., to Milwaukee Safety Devices, Inc. Fuse cut-out recloser apparatus. 4,321,575, Cl. 337-168.000.

Kotva, Rudolf: *See—*
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.

Koyo Seiko Company Limited: *See—*
Takaoka, Shuji; and Fujimoto, Shoji, 4,320,812, Cl. 180-143.000.

Kozlov, Jury I.: *See—*
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

Kozlova, Sofya L.: *See—*
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.

Kramer, Charles J., to Xerox Corporation. Linear integrating cavity light collector. 4,321,630, Cl. 358-294.000.

Kramer, Joseph O.; Young, Otto V.; Banner, Charles E.; and Schuster, John D., to Libbey-Owens-Ford Company. Material handling method and apparatus. 4,320,826, Cl. 198-425.000.

Krames, Lester; and Kim, Kyong. Nutritional value accumulating and display device. 4,321,674, Cl. 364-413.000.

Kreighbaum, William E.: *See—*
Matier, William L.; and Kreighbaum, William E., 4,321,398, Cl. 549-58.000.

KRG, Inc.: *See—*
Glassman, Stephen M.; Kice, James D.; and Ryding, Paul A., 4,320,722, Cl. 119-96.000.

Kristof, Mark J.; and Schwaderer, John R., to Whirlpool Corporation. Door latch interlock system for microwave oven. 4,321,445, Cl. 219-10.55C.

Kroener, Michael: *See—*
Schoch, Werner; Kroener, Michael; and Widder, Rudi, 4,321,41., Cl. 568-436.000.

Krogmann, Uwe, to Bodenseewerk Geratetechnik GmbH. Apparatus for the automatic determination of a vehicle position. 4,321,678, Cl. 364-453.000.

Kromer, Peter: *See—*
Muller, Anton; and Kromer, Peter, 4,320,561, Cl. 24-241.0PS.

Kron, Gerald J., to Singer Company, The. Advanced G cueing system. 4,321,044, Cl. 434-59.000.

Krone, Kenneth T.: *See—*
Hawwass, Ebrahim; Hawwass, Hassan; Nassif, John; Cajal, Victor A.; and Krone, Kenneth T., 4,321,673, Cl. 364-412.000.

Krtek, Jan, to CKD Praha, oborovy podnik. Process of pulse duration modulation of a multi-phase converter. 4,321,663, Cl. 363-137.000.

Kruesi, Paul R.; and Frahm, Veryl H., Jr., to Cato Research Corporation. Process for the recovery of molybdenum and rhenium from their sulfide ores. 4,321,089, Cl. 75-84.500.

Krugel, Karl-Heinz: *See—*
Tappeiner, Hermann; Paessler, Ernst-Robert; Smutny, Kurt; and Krugel, Karl-Heinz, 4,321,581, Cl. 340-310.00R.

Kruger, Dieter: *See—*
Grambow, Lutz; and Kruger, Dieter, 4,321,113, Cl. 204-1.00T.

Krumme, Helmut: *See—*
Heinemann, Otto; Lucke, Helmut; Schossler, Werner; Heiringhoff, Burkhard; and Krumme, Helmut, 4,320,926, Cl. 308-9.000.

Krupp Polysius AG: *See—*
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Korting, Reinhard, 4,320,586, Cl. 34-108.000.

Ku, Paul H. Voltage disconnect and supplemental heater device. 4,321,646, Cl. 361-92.000.

Kub, Francis J.: *See—*
Bluzer, Nathan; Lampe, Donald R.; and Kub, Francis J., 4,321,614, Cl. 357-30.000.

Kubicek, Louis A. Deburring tool. 4,320,998, Cl. 408-226.000.

Kubota, Yuichi: *See—*
Morita, Haruyuki; Kubota, Yuichi; and Imaoka, Yasuo, 4,321,303, Cl. 428-404.000.

Kucharzyk, Werner: *See—*
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.

Kuehne, Gerhard B.: *See—*
Miram, George V.; and Kuehne, Gerhard B., 4,321,505, Cl. 313-447.000.

Kuhl, Thomas, to Varta Batterie, Aktiengesellschaft. Tightly sealed galvanic element. 4,321,316, Cl. 429-174.000.

Kumagai, Shinobu: *See—*
Honda, Akira; Kumagai, Shinobu; and Takita, Hiroyuki, 4,320,668, Cl. 73-863.110.

Kumakura, Minoru: *See—*
Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, 4,321,117, Cl. 204-159.160.

Kumita, Izumi: *See—*
Takiguchi, Daigaku; Itou, Eiji; Nakamura, Hiroaki; and Kumita, Izumi, 4,321,363, Cl. 536-18.000.

Kummeling, Jozef W. M.; and Holweg, Hermanus A. C., to Volvo Car B.V. Method of and apparatus for making elements with profiled cross-section from sheet metal. 4,320,647, Cl. 72-203.000.

Kunisawa, Masuo: *See—*
Shimooka, Riyo; Atoji, Hitomi; Yamazaki, Takeshi; and Kunisawa, Masuo, 4,321,620, Cl. 358-75.000.

Kuo, Chun-Liang. Writing implement. 4,320,982, Cl. 401-57.000.

Kupiec, Christopher P.: *See—*
Kupiec, Edward J., Sr., 4,320,794, Cl. 164-406.000.

Kupiec, Edward J., Jr.: *See—*
Kupiec, Edward J., Sr., 4,320,794, Cl. 164-406.000.

Kupiec, Edward J., Sr., to Kupiec, Edward J., Sr.; Kupiec, Helen; Kupiec, Edward J., Jr.; Kupiec, Robert J.; Kupiec, Peter M.; Kupiec, Christopher P.; and Wessendorf, Roberta H., a part interest. Kupiec's mobile ingot extractor. 4,320,794, Cl. 164-406.000.

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Kupiec, Edward J., Sr., 4,320,794, Cl. 164-406.000.

Kupiec, Robert J.: *See—*
Kupiec, Edward J., Sr., 4,320,794, Cl. 164-406.000.

Kupriyanenko, Anatoly P.: *See—*
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.

Kuroda, Masatomo; and Minami, Masahumi, to Miyazwaki Steam Trap Mfg. Co., Ltd. Bimetallic column. 4,320,871, Cl. 236-59.000.

Kuroda, Shigeharu. Shock absorbing bumper for vehicles. 4,320,913, Cl. 293-120.000.

Kuroishi, Nobuhito: *See—*
Takeda, Yoshinobu; Kuroishi, Nobuhito; and Noji, Susumu, 4,321,091, Cl. 75-213.000.

Kurth, William T.; and Andrulitis, William B., to Exxon Research & Engineering Co. Solar cell modules. 4,321,417, Cl. 136-246.000.

Kurtz, Stuart J.: *See—*
Blakeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., 4,321,229, Cl. 264-349.000.

Kurumada, Tomoyuki: *See—*
Morimura, Syoji; Toda, Toshimasa; and Kurumada, Tomoyuki, 4,321,374, Cl. 544-198.000.

Kuzko, Antoni: *See—*
Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, 4,321,077, Cl. 71-40.000.

Labaw, Clifford S.; and Webb, Robert L., to SmithKline Corporation. Method for preparing 2-cyanamidobenzimidazoles or 2-cyanamidobenzoxazoles. 4,321,393, Cl. 548-222.000.

LaBerge, Colin L.: *See—*
McCoy, David R.; and LaBerge, Colin L., 4,321,147, Cl. 210-708.000.
McCoy, David R.; Gipson, Robert M.; Young, Kitchener B.; and LaBerge, Colin L., 4,321,148, Cl. 210-708.000.

La Fevor, Jack W.: *See—*
Stewart, Herbert M.; and La Fevor, Jack W., 4,320,856, Cl. 222-131.000.

Lamb, John T., to Tappan Company, The. Energization circuit for a microwave oven. 4,321,447, Cl. 219-10.55B.

Lambertus, Friedrich, to Werner & Pfleiderer. Device for granulating plastic strands. 4,321,026, Cl. 425-142.000.

Lampe, Donald R.: *See—*
Bluzer, Nathan; Lampe, Donald R.; and Kub, Francis J., 4,321,614, Cl. 357-30.000.

Landis, Bradley. Simulator and process for teaching surgical knot tying techniques. 4,321,047, Cl. 434-262.000.

Landouar, Pierre: *See—*
Kaplan, Daniel; Sol, Nicole; and Landouar, Pierre, 4,321,420, Cl. 136-255.000.

Landrau, Felix A.: *See—*
Eckenhoff, James B.; Geerke, Johan H.; and Landrau, Felix A., 4,320,758, Cl. 128-260.000.

Langer, Stanley H.; and Pate, Kevin T., to Wisconsin Alumni Research Foundation. Electrogenerative reduction of nitrogen oxides. 4,321,313, Cl. 429-13.000.

Langfield, Edward R.; Hile, James L.; and Hird, David L., to Elco International. Reciprocated concrete surfacer member with shielded spring return. 4,320,924, Cl. 299-37.000.

Lanier Business Products, Inc.: *See—*
Mohammadioun, Said, 4,321,460, Cl. 235-92.0CT.

Larson, Willis A., to Oak Industries Inc. Method of manufacture for bendable membrane switch. 4,320,573, Cl. 29-622.000.

Lassy, Carl O.; and Lassy, William A. Fireplace heater with reflector, heat retainer, forced draft and grate. 4,320,740, Cl. 126-121.000.

Lassy, William A.: *See—*
Lassy, Carl O.; and Lassy, William A., 4,320,740, Cl. 126-121.000.

Laurel Bank Machine Co., Ltd.: *See—*
Ohsako, Kyoichi, 4,321,671, Cl. 364-405.000.

Lauritzen, Ted, to United States of America, Energy. Automatic read-out micrometer. 4,320,577, Cl. 33-125.00A.

Lauterbach, Gary R.: *See—*
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,320,855, Cl. 222-56.000.

Lawes, Bernard C.; and Watts, John C., to Du Pont de Nemours, E. I., and Company. Method for solution mining of uranium ores. 4,320,923, Cl. 299-5.000.

Lawlor, Kenneth A.: *See—*
Abadie, Erwin I.; Lawlor, Kenneth A.; and Dick, John O., 4,320,703, Cl. 102-214.000.

Lawson, John E., to Mead Johnson & Company. Quaternary piperidinium halides. 4,321,386, Cl. 546-234.000.
Lawson, Maurice O.: *See—*
von Ohain, Hans J. P.; Wattendorf, Frank L.; and Lawson, Maurice O., 4,321,006, Cl. 415-115.000.
Layfield, Gilbert P.: *See—*
Melonio, Christ H.; and Layfield, Gilbert P., 4,321,105, Cl. 156-660.000.
Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Magnetic type printing process and multicopy magnetic printing machine. 4,321,606, Cl. 346-74.100.
Lear Siegler, Inc.: *See—*
Knoke, Silas J.; and Stamper, James F., 4,320,817, Cl. 182-126.000.
Leasher, Arthur L.; and McLaren, John W., to Dow Chemical Company, The. Protective shield for a pipe flange connection. 4,320,910, Cl. 285-45.000.
Leavens, W. Hudson, to Waltec, Inc. Discharge drain assembly. 4,320,540, Cl. 4-287.000.
Lebedkova, Valentina A.: *See—*
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.
LeBlanc, John R.: *See—*
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Lectrolarm Custom Systems, Inc.: *See—*
Smith, William V., 4,321,625, Cl. 358-210.000.
Ledley, Robert S.; and Golab, Thomas, to Georgetown University Medical Center. Computerized electro-oculographic (CEOG) system. 4,320,768, Cl. 128-733.000.
Ledniczki, Ferenc; Patak, Richard J.; and Wayne, Ronald G., to Touch Activated Switch Arrays, Inc. Touch activated controller and method. 4,321,479, Cl. 307-116.000.
Ledru, Francois, to Societe Europeene de Propulsion. High temperature thermal insulation material and method for making same. 4,321,154, Cl. 252-62.000.
Lee, Fred S., to Magnex Corporation. Thin film magnetic recording heads. 4,321,641, Cl. 360-126.000.
Lee, Roy C.: *See—*
Parlman, Robert M.; Lee, Roy C.; and Burns, Lyle D., 4,321,061, Cl. 44-63.000.
Leesona Corporation: *See—*
Stoehr, Steven M.; Hannula, Fred W.; Dumaine, Thomas J.; Batting, Robert D.; and Smithern, Earl D., 4,321,027, Cl. 425-216.000.
Le Gravier, Serge: *See—*
Dran, Maurice; Dages, Daniel; and Le Gravier, Serge, 4,321,418, Cl. 136-251.000.
Lehmann, Hans-Dieter, to Gambro Dialysatoren KG. Process for the catalytic setting of polyurethane molding compositions. 4,321,350, Cl. 528-48.000.
Lehureau, Jean-Claude, to Thomson-CSF. Endless magnetic tape video recorder/player with head centering means. 4,321,634, Cl. 360-70.000.
Leibhard, Erich: *See—*
Herb, Armin; and Leibhard, Erich, 4,320,857, Cl. 222-146.0HE.
Leinberger, Klaus; and Golke, Heinz, to Messer Griesheim GmbH. Burner head of a fuel-oxygen burner. 4,320,874, Cl. 239-403.000.
Leis, Michael D.; and Rose, Robert C., to Digital Equipment Corporation. Positioning system and formatting scheme for magnetic tape media. 4,321,632, Cl. 360-49.000.
Lemmers, Eugene: *See—*
Hammer, Edward E.; and Lemmers, Eugene, 4,321,502, Cl. 313-198.000.
Lemoine, Maurice G., to Ampex Corporation. Parity checking circuitry for use in multi-bit cell PCM recording and reproducing apparatus. 4,321,704, Cl. 371-51.000.
Lenthe, Manfred: *See—*
Buttner, Gerhard; Christmann, Karl-Friedrich; Lenthe, Manfred; and Allenbach, Udo, 4,321,204, Cl. 260-346.220.
Lenz, Charles E., to Magnetic Peripherals Inc. Cateye-signal intercept detector for aligning a read-write head above a computer data storage disk. 4,321,636, Cl. 360-77.000.
Lenz, Robert W.; and Vert, Michel, to Research Corporation. Malic acid polymers. 4,320,753, Cl. 128-156.000.
Leo, Bengt. Tripod arm. 4,320,884, Cl. 248-276.000.
Leonard, Verna M. Musical structural integrator. 4,320,690, Cl. 84-480.000.
Lesartre, Paul, to U.S. Philips Corporation. Circuit for stabilizing frequency of FET oscillator as output power varies. 4,321,563, Cl. 331-117.0FE.
Leschonski, Kurt; and Rothele, Stephan. Method of and sorting assembly for dry sorting granular mixtures of two or more polydispersed components. 4,321,134, Cl. 209-30.000.
Lesk, I. Arnold: *See—*
Sarma, Kalluri R.; Rice, M. John, Jr.; Lesk, I. Arnold; and Nikirk, Roger G., 4,321,246, Cl. 423-350.000.
Lever Brothers Company: *See—*
Hasegawa, Tatsuru; Ohmi, Yasuo; Ricketts, Guy A. G.; and Sime, Stuart J., 4,321,256, Cl. 424-70.000.
Levin, Ronald H.: *See—*
Anderson, Howard W.; and Levin, Ronald H., 4,321,318, Cl. 430-59.000.
Levine, Sol; Kamen, Melvin E.; DeFazio, August; and Cueli, Peter, to Revlon, Inc. Process for making metallic leafing pigments. 4,321,087, Cl. 75-0.50A.
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Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, 4,321,077, Cl. 71-40.000.
Lewis, Edward L.: *See—*
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Lewis, Jeffrey J. Wind instrument with continuously variable pitch control. 4,320,686, Cl. 84-380.00R.
Li, Steven S. Drain clearing device. 4,320,539, Cl. 4-256.000.
Libbey-Owens-Ford Company: *See—*
Kramer, Joseph O.; Young, Otto V.; Banner, Charles E.; and Schuster, John D., 4,320,826, Cl. 198-425.000.
Licciardi, Marcello; and Licciardi, Stefano. Device for adjusting the height and protrusion of a rollable sun-blind. 4,320,792, Cl. 160-74.000.
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Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Schroder, Ernst; and Wermuth, Jurgen, 4,321,482, Cl. 307-262.000.
Lien, Wayne W., to RTE Corporation. Fuse holder-under oil drywell loadbreak device. 4,321,576, Cl. 337-202.000.
Lignes Telegraphiques et Telephoniques: *See—*
Dubos, Jacques; Faure, Michel; and Lumineau, Yves, 4,321,072, Cl. 65-3.110.
Lilienfeld, Pedro, to GCA Corporation. Passive smoke plume opacity monitor. 4,320,975, Cl. 356-364.000.
Lin, Robert I.: *See—*
Hilton, Barney W.; Lin, Robert I.; and Crnkovich, Greg, 4,320,658, Cl. 73-437.000.
Lin, Shiow-Ching, to DeSoto, Inc. Organic polymers with acylurea repeating units having tertiary amino groups pendant therefrom and cathodic electrocoating of said polymers. 4,321,172, Cl. 524-591.000.
Lindbergh, Charles. Outward thrusting door weatherstrip. 4,320,793, Cl. 160-201.000.
Lindstrom, John W.; Boyd, Walter A.; and Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Mechanism for applying merchandising labels to packages/objects of different weights and dimensions. 4,321,103, Cl. 156-351.000.
Linhart, Friedrich: *See—*
Eicken, Karl; Rohr, Wolfgang; and Linhart, Friedrich, 4,321,395, Cl. 548-253.000.
Link, Theodore P.: *See—*
Walters, Donald N.; and Link, Theodore P., 4,320,904, Cl. 280-7.120.
Link, William T., to Diagraphix, Inc. Carriage support arrangement for a microfiche reader. 4,320,943, Cl. 353-27.00R.
Litton Systems, Inc.: *See—*
McNair, Fred, 4,321,557, Cl. 372-33.000.
Tregay, John L., 4,321,564, Cl. 332-7.510.
Liu, Frank C.: *See—*
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Westphal, Bernd A. K.; Moore, James H., Jr.; and Livingston, Richard G., 4,320,625, Cl. 60-646.000.
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Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.
Ljung, Bo H. G., to Singer Company, The. Pathlength controller for a ring laser cyroscope. 4,320,974, Cl. 356-350.000.
Lockheed Missiles & Space Co., Inc.: *See—*
Ward, Robert B., 4,321,565, Cl. 333-150.000.
Lockwood, Robert J.: *See—*
Alberino, Louis M.; and Lockwood, Robert J., 4,321,333, Cl. 521-159.000.
Loctite Corporation: *See—*
Rich, Richard D., 4,321,349, Cl. 526-270.000.
Lodge-Cottrell Ltd.: *See—*
Cottrell, Terence B. F.; and Paddock, Dennis C., 4,321,068, Cl. 55-148.000.
Loeb, Marvin P., to Contracap, Inc. Cervical cap with foam lining. 4,320,751, Cl. 128-127.000.
Logan, Douglas W.: *See—*
Grace, Thad N.; Folmer, Carroll W.; and Logan, Douglas W., 4,320,912, Cl. 292-341.180.
Long, Lawrence J., to Westinghouse Electric Corp. Peripheral connector ring stator end winding for dynamoelectric machines. 4,321,497, Cl. 310-198.000.
Longbrake, Howard R. Knife sharpener. 4,320,892, Cl. 269-3.000.
Loper, Carl R., Jr.: *See—*
Perepezko, John H.; Rasmussen, Don H.; and Loper, Carl R., Jr., 4,321,086, Cl. 75-0.50C.
Lopez, Alfred R., to Hazeltine Corporation. Array antenna system. 4,321,605, Cl. 343-844.000.
Lopiccola, Joseph F.: *See—*
Braun, Paul E.; Lopiccola, Joseph F.; and Freismuth, Richard J., 4,320,731, Cl. 123-440.000.
Lord, Frank K., to Union Oil Company of California. Apparatus for the bulk delivery of volatile liquids. 4,320,788, Cl. 141-290.000.

L'Oreal: *See—*
Jacquet, Bernard; Papantoniou, Christos; Vanlerberghe, Guy; and Mondet, Jean, 4,321,348, Cl. 526-218.000.
Lorenz, Donald H.; and Gruber, Bruce A., to GAF Corporation. Copolymerizable, ultraviolet light absorber allyloxy-2-(2H-benzotriazol-2-yl)-4-alkylbenzenes. 4,321,396, Cl. 548-260.000.
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Lowe, Christopher M., to Union Carbide Corporation. Process for heat carrier generation. 4,321,131, Cl. 208-130.000.
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Jahnke, Richard W., 4,321,308, Cl. 428-469.000.
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Balachandran, Chardrasegaram, 4,320,734, Cl. 123-510.000.
Cryer, Edward, 4,321,437, Cl. 200-61.540.
Farr, Glyn P. R., 4,320,622, Cl. 60-418.000.
Forrester, John S.; and Rendall, David, 4,320,667, Cl. 73-862.640.
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Lucke, Roland, to Gebr. Lodige Maschinenbau GmbH. Mixer. 4,320,979, Cl. 366-325.000.
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Dubos, Jacques; Faure, Michel; and Lumineau, Yves, 4,321,072, Cl. 65-3.110.
Luna, L. Jack. Repairable spring probe assembly. 4,321,532, Cl. 324-158.00F.
Lundberg, Charles A., Jr.; and Farr, Robert A., to Richardson-Merrell Inc. 2-Amino-11b-aryl-benzo[a]quinolizines. 4,321,382, Cl. 546-95.000.
Luoma, Ernie V.: *See—*
Cheng, Wen-Jiu; and Luoma, Ernie V., 4,321,367, Cl. 536-88.000.
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Lynnworth, Lawrence C.; Seger, John L.; and Bradshaw, James E., to Panametrics, Inc. Ultrasonic system for measuring fluid impedance or liquid level. 4,320,659, Cl. 73-589.000.
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Hajek, Josef; Rotter, Siegfried; Schwopfinger, Hans; and Schwarz, Josef, 4,321,051, Cl. 493-439.000.
Maas, Edward T., Jr.; and Cox, Donald M., to Exxon Research & Engineering Co. Isotope separation process. 4,321,116, Cl. 204-158.00R.
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., to University Patents, Inc. Electrochemical doping of conjugated polymers. 4,321,114, Cl. 204-2.100.
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Holland, William P.; and Pellegrino, Anthony, 4,321,471, Cl. 250-406.000.
MacIver, Bernard A., to General Motors Corporation. High resolution lithography system for microelectronic fabrication. 4,321,317, Cl. 430-5.000.
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Terai, Kiyohide; and Mackertich, George, 4,321,453, Cl. 219-121.0ED.
Macmillan, Richard, to Siemens Aktiengesellschaft. Microcomputer network having several microcomputer modules which are coupled onto at least one system bus. 4,321,669, Cl. 364-200.000.
MacNab, Robert B., to BBC Brown, Boveri & Company, Ltd. Air-gap winding in an electrical machine. 4,321,494, Cl. 310-179.000.
Maeda, Kohichi: *See—*
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Maeshima, Katsuyoshi: *See—*
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Magee, Philip S., to Chevron Research Company. Algicidal and fungicidal 1-halo-2-substituted-thioethyl sulfones, 2-substituted-thiovinyl sulfones, and 1,2-dihalothioethyl sulfones. 4,321,080, Cl. 71-67.000.
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Mlot-Fijalkowski, Adolf; and Borrows, Kenneth P., 4,321,534, Cl. 324-216.000.
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Lee, Fred S., 4,321,641, Cl. 360-126.000.
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Rudd, Edward H., 4,320,842, Cl. 209-636.000.
Magnier, Claude; and Grosbois, Jean, to Groupement Franco-Senagalais d'Etudes et de Recherches Industrielles. Process for the treatment of a calcium aluminophosphate. 4,321,244, Cl. 423-320.000.
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Mallon, Richard G., to United States of America, Energy. Preparation of grout for stabilization of abandoned in-situ oil shale retorts. 4,320,994, Cl. 405-267.000.
Mallory, John; and Turlej, Zbignew W., to Isotec Industries Limited. Sensitivity test system for photoelectric smoke detector by changing light source intensity. 4,321,466, Cl. 250-574.000.
Maloney, Thomas M.; and Huffaker, E. Max, to Washington State University Research Foundation, Inc. Particleboard furnish blender. 4,320,715, Cl. 118-303.000.
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Klimenko, Vladimir I. Method for separating solid phase from drilling mud. 4,321,135, Cl. 209-49.000.
Mamo, Anthony C. Method for moving icebergs in a body of water and related apparatus. 4,320,989, Cl. 405-52.000.
Mandai, Masaaki: *See—*
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Manderscheid, Phillip H., to BJ-Hughes Inc. Valve retrieval mechanism for an inflatable packer system. 4,320,803, Cl. 166-334.000.
Mandet, Gerard M. F.: *See—*
Ayache, Michel R.; Głowacki, Pierre A.; and Mandet, Gerard M. F., 4,320,903, Cl. 277-22.000.
Manna, Albert, to Caterpillar Tractor Co. Differential lock control. 4,320,813, Cl. 180-249.000.
Manor, Giora. Temperature control systems. 4,320,870, Cl. 236-37.000.
Mantegani, Sergio; Arcari, Guiliana; Caravaggi, Anna M.; and Bosisio, Germano, to Farmitalia Carlo Erba S.p.A. Ergot derivatives. 4,321,381, Cl. 546-67.000.
Manville Service Corporation: *See—*
Green, John D., 4,320,969, Cl. 356-221.000.
Marchese, Michele J.; and Troxel, William R. W. Mechanized water board. 4,321,048, Cl. 440-32.000.
Marechal, Robert A.: *See—*
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Mares, Frank: *See—*
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Maresca, Louis M.; Matzner, Markus; and See, Benito, to Union Carbide Corporation. Process for preparing polyarylates. 4,321,355, Cl. 528-180.000.
Marin, Heiner: *See—*
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Mark, Victor, to General Electric Company. 1-Methyl-2(alkylimino)-pyrrolidines and 1-methyl 2(cycloalkylimino) pyrrolidines. 4,321,202, Cl. 260-326.860.
Markling, Jorgen, to A/S Surgimed. Method and apparatus for making tubular products such as catheters. 4,321,226, Cl. 264-139.000.
Marmon Company: *See—*
Schreier, Wilford R., 4,320,682, Cl. 84-1.260.
Marquet, Jean-Francois: *See—*
Hernandez, Charles; and Marquet, Jean-Francois, 4,321,596, Cl. 340-724.000.
Marshall, Jay K., to Sangamo-Weston Inc. Direction sensitive pulse initiator for a wattmeter. 4,321,531, Cl. 324-142.000.
Martens, Edward J., III; and Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Controlled release air freshener using an absorbent generator. 4,320,873, Cl. 239-6.000.
Martikainen, Jaakko, to Oy Wartsila AB. Adjustable cylinder lock. 4,320,640, Cl. 70-366.000.
Martin Industries, Inc.: *See—*
Wilhoite, Murray O., 4,320,739, Cl. 126-110.00A.
Martin, Jerry D.; Ward, Gary A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Collapsible solution container. 4,320,789, Cl. 150-0.500.

Martin, Joel T., to Documation Incorporated. Expanded character generator. 4,321,597, Cl. 340-724.000.

Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,320,757, Cl. 128-214.00F.

Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., to Teepak, Inc. Continuous shirring and spinning machine for casings. 4,320,558, Cl. 17-42.000.

Martinek, Thomas W.: *See*—
Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., 4,320,558, Cl. 17-42.000.

Martini, Thomas: *See*—
Smerz, Otto; Martini, Thomas; Billenstein, Siegfried; and Adrian, Klaus, 4,321,052, Cl. 8-107.000.

Marto, John H., to J. I. Case Company. Lawn mower suspension. 4,320,616, Cl. 56-15.300.

Martor-Argentax E. H. Beermann KG, Firma: *See*—
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Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.

Marvin Glass & Associates: *See*—
Morrison, Howard J.; Breslow, Jeffrey D.; and Harper, Rex M., 4,320,901, Cl. 273-237.000.

Marwin Foundry Units Limited: *See*—
Flint, Leslie; and Brown, Malcolm P., 4,320,755, Cl. 128-205.120.

Masaki, Yasunori: *See*—
Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, 4,321,344, Cl. 526-64.000.

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Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,321,384, Cl. 546-123.000.

Maselli, John A.; and Horwath, Robert O., to Standard Brands Incorporated. Carbohydrate process. 4,321,323, Cl. 435-105.000.

Maselli, John A.; and Horwath, Robert O., to Standard Brands Incorporated. Process for making glucosone. 4,321,324, Cl. 435-105.000.

Mashberg, Arthur, to United States of America, Health and Human Services. Detection of malignant lesions of the oral cavity utilizing toluidine blue rinse. 4,321,251, Cl. 424-3.000.

Masuda, Senichi. Electric dust collecting apparatus. 4,321,066, Cl. 55-114.000.

Masunaga, Makoto: *See*—
Hosoe, Kazuya; Tsunekawa, Tokuichi; Masunaga, Makoto; and Sakane, Toshio, 4,320,948, Cl. 354-31.000.

Matge, Alain: *See*—
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Mathis, Terry D.: *See*—
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Matier, William L.; and Kreighbaum, William E., to Mead Johnson & Company. Thienyl and benzothienyl-tertiary butylaminophenoxypropanols. 4,321,398, Cl. 549-58.000.

Matrone, John L., to Fairchild Camera & Instrument Corp. Printed circuit board test fixture having interchangeable card personalizers. 4,321,533, Cl. 324-158.00F.

Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Process for production of metal-containing ionic cured rubbers. 4,321,352, Cl. 528-115.000.

Matsui, Katsuhiko, to Nissan Motor Co., Ltd. Fuel filtering device for engine. 4,321,136, Cl. 210-86.000.

Matsukawa, Masao: *See*—
Hisashi, Mino; Matsukawa, Masao; and Nagashima, Minematsu, 4,321,309, Cl. 428-522.000.

Matsukuma, Yutaka: *See*—
Nakajo, Toshihiko; Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,321,654, Cl. 361-396.000.

Matsumoto, Shinichiro, to Mitsubishi Chemical Industries, Limited. Method for optically assaying liquid samples with polyganol transparent stirrer. 4,320,977, Cl. 356-427.000.

Matsumoto, Zensho: *See*—
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Matsunaga, Iwao, to Mitsubishi Jukogyo Kabushiki Kaisha. Vehicle starting method. 4,321,522, Cl. 320-2.000.

Matsunaga, Tsunebumi: *See*—
Shiozawa, Kaoru; and Matsunaga, Tsunebumi, 4,321,448, Cl. 219-57.000.

Matsuoka, Hideoki: *See*—
Nakamori, Takashi; Matsumoto, Zensho; Matsushita, Kiyomi; Katoh, Masayoshi; and Matsuoka, Hideoki, 4,320,909, Cl. 280-752.000.

Matsushige, Takashi: *See*—
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Matsushita Electric Corp. of America: *See*—
Rzeszewski, Theodore S., 4,321,623, Cl. 358-144.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Minamide, Seiko; Okuda, Makoto; Nakata, Shinobu; and Fukui, Tadahiro, 4,321,287, Cl. 427-157.000.

Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,321,123, Cl. 204-195.00B.

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Nakamori, Takashi; Matsumoto, Zensho; Matsushita, Kiyomi; Katoh, Masayoshi; and Matsuoka, Hideoki, 4,320,909, Cl. 280-752.000.

Matsutani, Hideki; and Wada, Hiroto, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic microphone. 4,321,432, Cl. 179-111.00R.

Matsuyama, Shigeru: *See*—
Sado, Ichiro; and Matsuyama, Shigeru, 4,321,688, Cl. 364-900.000.

Matthai, Gunter, to Robert Bosch GmbH. Rectifier assembly with heat sink. 4,321,664, Cl. 363-141.000.

Mattheiss, Eugen: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,320,806, Cl. 173-12.000.

Matthews, Russell B., to Johnson Controls, Inc. Fuel ignition and stack damper control circuit. 4,321,030, Cl. 431-20.000.

Matthies, Hans G.: *See*—
Neuberg, Rainer; Matthies, Hans G.; and Druschke, Wolfgang, 4,321,341, Cl. 525-437.000.

Mattson, Frank K.: *See*—
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Maumy, Alain: *See*—
Duda, Eugene; Maumy, Alain; and Tondu, Claude, 4,321,617, Cl. 357-71.000.

Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, to Bayer Aktiengesellschaft. Preparation of 1,3-dibromo-2,2-dimethyl-propane-1,3-dicarboxylic acid derivatives. 4,321,408, Cl. 560-192.000.

Mautz, Karlheinz: *See*—
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Max-Planck-Gesellschaft: *See*—
Wahl, Jochen; and Breitschwerdt, Alfred, 4,321,163, Cl. 252-518.000.

Mayer, Siegfried; and Altpeter, Arno, to Robert Bosch GmbH. Arrangement for connecting two structural parts. 4,320,984, Cl. 403-292.000.

McAbery, James W., to Standard Oil Company (Indiana). Process for extraction and neutralization of hydrocarbon sulfonic acids. 4,321,215, Cl. 260-504.00S.

McCarthy, Alfred F.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,321,423, Cl. 174-16.0HS.

McCleary, Barry V., to Minister for Public Works for the State of New South Wales. Preparation of soluble chromogenic substrates. 4,321,364, Cl. 536-18.000.

McClure, Leon C.; and McClure, Stanley, Sr. Herbicide applicator. 4,320,595, Cl. 47-1.500.

McClure, Stanley, Sr.: *See*—
McClure, Leon C.; and McClure, Stanley, Sr., 4,320,595, Cl. 47-1.500.

McCoy, Allan W., to Garrett Corporation, The. Wide range compressor. 4,321,008, Cl. 415-157.000.

McCoy, David R.; Gipson, Robert M.; and Young, Kitchener B., to Texaco Inc.; and Texaco Canada, Inc. Demulsification of bitumen emulsions with a high molecular weight mixed alkylene oxide polyol. 4,321,146, Cl. 210-708.000.

McCoy, David R.; and LaBerge, Colin L., to Texaco Inc.; and Texaco Canada, Inc. Demulsification of bitumen emulsions with a high molecular weight polyol containing discrete blocks of ethylene and propylene oxide. 4,321,147, Cl. 210-708.000.

McCoy, David R.; Gipson, Robert M.; Young, Kitchener B.; and LaBerge, Colin L., to Texaco Inc.; and Texaco Canada, Inc. Demulsification of bitumen emulsions. 4,321,148, Cl. 210-708.000.

McDonald, Brian G., to Beecham Group Limited. Heterocyclic and aliphatic growth promotors. 4,321,271, Cl. 424-267.000.

McDonnell Douglas Corporation: *See*—
Jerome, Jonathan A.; Neu, Frank D.; and Faraghan, Geoffrey T., 4,321,622, Cl. 358-128.500.

McGarrity, Richard V., to Federal Pacific Electric Company. Electrical circuit interruptors. 4,321,436, Cl. 200-48.0KB.

McGrady, Joseph, to Procter & Gamble Company, The. Liquid detergent compositions containing corrosion inhibiting system. 4,321,166, Cl. 252-542.000.

McGraw-Edison Company: *See*—
Pertici, Andrew L., 4,321,574, Cl. 337-165.000.

McGreal, Joseph E., Jr.: *See*—
Feinman, Jerome; and McGreal, Joseph E., Jr., 4,321,242, Cl. 423-244.000.

McGrew, James. Paint roller cleaning apparatus. 4,320,550, Cl. 15-3.000.

McIlrath, William P., to Racine Railroad Products, Inc. Clip-applying machine. 4,320,707, Cl. 104-1.00R.

McKay, Dwight L.: *See*—
Bertus, Brent J.; and McKay, Dwight L., 4,321,129, Cl. 208-120.000.

McLaren, John W.: *See*—
Leasher, Arthur L.; and McLaren, John W., 4,320,910, Cl. 285-45.000.

McMillan, Stephen L., to General Electric Company. Mechanism for orbiting washer. 4,320,636, Cl. 68-23.00R.

McMorrow, John J. Blood segment processor. 4,320,787, Cl. 141-98.000.

McMullen, Frederick G. Process for wastewater treatment and wastewater sludge conversion into energy. 4,321,150, Cl. 210-769.000.
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McNair, Fred, to Litton Systems, Inc. Laser gyro coupling system. 4,321,557, Cl. 372-33.000.
McNutt, Michael J., to Rockwell International Corporation. Charge coupled digital-to-analog converter. 4,321,584, Cl. 340-347.0DA.
McRitchie, Allan C.: *See—*
Smith, Rory J. M.; and McRitchie, Allan C., 4,321,165, Cl. 252-528.000.
McVicker, Gary B., to Exxon Research & Engineering Co. Carbonylation catalysts. 4,321,211, Cl. 260-429.00R.
McWilliams, Orcenith D., to Caterpillar Tractor Co. Hydraulic load lifting system with hydraulic surcharge to make up valve pilot lines. 4,320,691, Cl. 91-437.000.
Mead Johnson & Company: *See—*
Lawson, John E., 4,321,386, Cl. 546-234.000.
Matier, William L.; and Kreighbaum, William E., 4,321,398, Cl. 549-58.000.
Megahed, Shenoda S.: *See—*
Eichhorn, Edward C.; Nugent, Edward L.; and Megahed, Shenoda S., 4,320,769, Cl. 128-763.000.
Meidensha Electric Mfg. Co., Ltd.: *See—*
Fujii, Toshinobu; Hirose, Takashi; and Kondo, Naoki, 4,321,312, Cl. 429-12.000.
Meisner, Alfred; and Grasser, Hans, to Diehl GmbH & Co. Process and circuit for the setting of an electronic digital display. 4,321,697, Cl. 368-187.000.
Meldahl, Robert D.; and Borel, Robert J., to J. A. Masterson & Company. Clutch-brake system for rotary mower. 4,320,822, Cl. 192-18.00R.
Melonio, Christ H.; and Layfield, Gilbert P., to Standex International Corporation. Method of producing embossed designs on surfaces. 4,321,105, Cl. 156-660.000.
Menetrier, Marc G. Y.: *See—*
Fortunato, Gerard; Marechal, Robert A.; and Menetrier, Marc G. Y., 4,320,973, Cl. 356-346.000.
Mercer Corporation: *See—*
Mercer, Jeffrey L.; and White, James B., 4,320,858, Cl. 222-146.0HE.
Mercer, Jeffrey L.; and White, James B., to Mercer Corporation. Hot melt adhesive applicator. 4,320,858, Cl. 222-146.0HE.
Merck & Co., Inc.: *See—*
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Vickers, Stanley, 4,321,264, Cl. 424-233.000.
Wang, Ching C.; and Fisher, Michael H., 4,321,267, Cl. 424-263.000.
Wang, Ching C.; and Fisher, Michael H., 4,321,274, Cl. 424-304.000.
Meritis, Alexanderos. Storable automotive seat cover. 4,320,922, Cl. 297-220.000.
Merz & Co.: *See—*
Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,321,268, Cl. 424-266.000.
Messer Griesheim GmbH: *See—*
Leinberger, Klaus; and Golke, Heinz, 4,320,874, Cl. 239-403.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Schwarz, Alois; and Mautz, Karlheinz, 4,321,013, Cl. 416-244.00R.
Messing, Ralph A., to Corning Glass Works. Method for processing waste. 4,321,141, Cl. 210-603.000.
Meszaros, Zoltan: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Bitter, Istvan; Horvath, Agnes; and Vasvari nee Debreczy, Lelle, 4,321,377, Cl. 544-282.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Gupner, Otto; and Steuernagel, Walter, 4,321,067, Cl. 55-135.000.
Meyer, Danny S.; and Shelton, William S., to ACF Industries, Incorporated. Valve seat structure. 4,320,890, Cl. 251-328.000.
Meyer, Hal G., to Precision Governors, Inc. Rotary actuator with selectable response characteristics. 4,321,571, Cl. 325-272.000.
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, to Bayer Aktiengesellschaft. High impact polyamide blends. 4,321,336, Cl. 525-183.000.
Meyerhofer, Dietrich: *See—*
Kaplan, Michael; Poliniak, Eugene S.; and Meyerhofer, Dietrich, 4,321,470, Cl. 250-398.000.
Meyering, Samuel; and van der Molen, Engelbertus J., to Vandermolen B.V. Storing or packing device comprising a number of separate container elements. 4,320,846, Cl. 220-20.000.
Meyers, F. D.: *See—*
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,321,074, Cl. 65-12.000.
Meyl, Wolfgang: *See—*
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,321,683, Cl. 364-561.000.
Meywald, Klaus: *See—*
Ohnmacht, Helmut; and Meywald, Klaus, 4,321,456, Cl. 219-364.000.
Mia, Gian V.; and Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Machine for typing characters. 4,320,980, Cl. 400-70.000.
Michaud, Michael A. Slow release fertilizer composition. 4,321,078, Cl. 71-44.000.
Middelhoven, Paul J., to Paccar Inc. Electric-hydrostatic drive modules for vehicles. 4,320,814, Cl. 180-294.000.
Mike Roberts Color Productions: *See—*
Stolle, William H.; and Duderstadt, John C., 4,320,547, Cl. 11-1.0AC.
Miles, Gregory M., to Honeywell Inc. Positive differential alternating current switching means. 4,321,480, Cl. 307-117.000.
Miller, Alan; Schweizer, Edward E.; and Campanello, John, to Ipco Corporation. Endodontic instrument. 4,321,040, Cl. 433-102.000.
Miller, Eugene L., to American Cyanamid Company. Water-resistant black flexographic ink. 4,321,178, Cl. 524-159.000.
Miller, John C.: *See—*
Blaʰeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., 4,321,229, Cl. 264-349.000.
Miller, Lester I., to Du Pont de Nemours, E. I., and Company. Water based alkyd resin coating composition containing a polyisocyanate crosslinking agent. 4,321,169, Cl. 524-428.000.
Miller, Melvin L. Method of illustrating how the outside of a building will appear to the viewer if a building material is added to the outside of the building. 4,321,037, Cl. 434-74.000.
Miller, Robert C., to Westinghouse Electric Corp. Device for measuring vibration phase and amplitude. 4,321,464, Cl. 250-231.00R.
Miller, Robert C.: *See—*
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.
Milliken Research Corporation: *See—*
Kluger, Edward W.; and Su, Tien K., 4,321,353, Cl. 528-120.000.
Kluger, Edward W.; Su, Tien-Kuei; and Thompson, Teresa J., 4,321,354, Cl. 528-122.000.
Millipore Corporation: *See—*
Nix, Paul T.; and Fields, Spencer, 4,321,397, Cl. 548-366.000.
Mills, Thomas V. Self-loading carpet cart. 4,321,004, Cl. 414-490.000.
Milwaukee Safety Devices, Inc.: *See—*
Koszewa, Bernhard; and Thomas, Arthur L., 4,321,575, Cl. 337-168.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corp. Stabilized composition comprising a dihydric alcohol thiodipropionic acid ester. 4,321,191, Cl. 524-285.000.
Minami, Masahumi: *See—*
Kuroda, Masatomo; and Minami, Masahumi, 4,320,871, Cl. 236-59.000.
Minamide, Seiko; Okuda, Makoto; Nakata, Shinobu; and Fukui, Tadahiro, to Matsushita Electric Industrial Co., Ltd. Method of producing thermoluminescence dosimeter element. 4,321,287, Cl. 427-157.000.
Minekawa, Hiroshi: *See—*
Fujii, Katsuhiko; Ueda, Minoru; and Minekawa, Hiroshi, 4,320,791, Cl. 152-362.00R.
Minister for Public Works for the State of New South Wales: *See—*
McCleary, Barry V., 4,321,364, Cl. 536-18.000.
Minnesota Mining and Manufacturing Co.: *See—*
Baker, Leslie R.; and Reisem, Daniel E., 4,321,652, Cl. 361-209.000.
Froehlich, Harold E., 4,321,002, Cl. 411-457.000.
Tamaki, Tohru, 4,320,834, Cl. 206-404.000.
Williams, Brian H.; and Young, Chung-I, 4,321,404, Cl. 560-115.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ikeda, Hiroshi; and Takeuchi, Koji, 4,320,954, Cl. 355-3.00R.
Nakai, Masaaki, 4,320,944, Cl. 354-23.00D.
Miram, George V.; and Kuehne, Gerhard B., to Varian Associates, Inc. Zero-bias gridded gun. 4,321,505, Cl. 313-447.000.
Mitchell, Hal D., to A-T-O Inc. Shoulder pad. 4,320,537, Cl. 2-2.000.
Mitel Corporation: *See—*
Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., 4,321,431, Cl. 179-18.0AH.
Mitsubishi Chemical Industries, Limited: *See—*
Matsumoto, Shinichiro, 4,320,977, Cl. 356-427.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,321,518, Cl. 318-696.000.
Fujiwara, Kouhei; and Hosogai, Setsuo, 4,321,440, Cl. 200-153.00G.
Takatsuki, Toshiharu; Fujiwara, Ken-ichi; Yanagisawa, Sinobu; and Okamura, Shigeru, 4,321,429, Cl. 179-2.0DP.
Tsuchihashi, Michihiro; Itatani, Ryohei; Ryohko, Masatoshi; and Murai, Yutaka, 4,321,506, Cl. 315-35.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Matsunaga, Iwao, 4,321,522, Cl. 320-2.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Shiozawa, Kaoru; and Matsunaga, Tsunebumi, 4,321,448, Cl. 219-57.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Ono, Hiroshi; Fujii, Hidetsugu; Morikawa, Haruyuki; and Fukui, Akito, 4,321,410, Cl. 564-67.000.
Mittal, Faquir C., to Sperry Corporation. Fluid pump. 4,321,020, Cl. 417-320.000.
Miu, Ming T.: *See—*
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.
Miyahara, Yoshihisa; Kobayashi, Kimimasa; Kobayashi, Yawara; and Harada, Tsuneo, to Nichias Corporation; and Riken Corporation. Electrical heating molded-element comprising inorganic fibers. 4,321,459, Cl. 219-544.000.
Miyaji, Masahiro; and Hirose, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Dimmer. 4,321,509, Cl. 315-291.000.

Miyakawa, Eiji, to Miyakawa Industry Company, Limited. Spindle holder guide member for multiple spindle attachment. 4,320,997, Cl. 408-46.000.
Miyakawa Industry Company, Limited: *See*—
Miyakawa, Eiji, 4,320,997, Cl. 408-46.000.
Miyata, Katsuhiko: *See*—
Aoki, Harumi; Miyata, Katsuhiko; and Sawada, Yoshio, 4,320,946, Cl. 354-25.000.
Miyazaki, Takeshi: *See*—
Nishida, Hiroshi; Nakamizo, Keiichi; Inoue, Takemi; and Miyazaki, Takeshi, 4,320,713, Cl. 114-123.000.
Miyazwaki Steam Trap Mfg. Co., Ltd.: *See*—
Kuroda, Masatomo; and Minami, Masahumi, 4,320,871, Cl. 236-59.000.
Mizukoshi, Akio: *See*—
Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.
Mlot-Fijalkowski, Adolf; and Borrows, Kenneth P., to Magnaflux Corporation. Magnetic particle testing procedure involving pre-coating with a hydrophobic coating. 4,321,534, Cl. 324-216.000.
Mobil Oil Corporation: *See*—
Hungerford, Gordon P., 4,321,230, Cl. 264-556.000.
Mobil Tyco Solar Energy Corporation: *See*—
Patel, Kirit B.; and Gonsiorawski, Ronald, 4,321,283, Cl. 427-74.000.
Mohammadioun, Said, to Lanier Business Products, Inc. Digital control apparatus. 4,321,460, Cl. 235-92.0CT.
Molyneaux, Thomas A.: *See*—
Cox, Alvon R.; and Molyneaux, Thomas A., 4,321,183, Cl. 524-423.000.
Mondet, Jean: *See*—
Jacquet, Bernard; Papantoniou, Christos; Vanlerberghe, Guy; and Mondet, Jean, 4,321,348, Cl. 526-218.000.
Money, David, to Telectronics Pty. Limited. Protection device for pacemaker implantees. 4,320,763, Cl. 128-419.0PG.
Monsanto Company: *See*—
Bollinger, Frederic G., 4,321,082, Cl. 71-90.000.
Cohen, Saul M.; and LeBlanc, John R., 4,321,375, Cl. 544-221.000.
Montoya, Joseph D. Trash can lid having securing means. 4,320,851, Cl. 220-324.000.
Moore, Donald E., to Ford Motor Company. Cap assembly for a fuel tank in a motor vehicle. 4,320,853, Cl. 220-375.000.
Moore, Donn F.; and Folkerts, Michael A., to Computer Peripherals, Inc. Dot matrix printer with half space dot capability. 4,321,610, Cl. 346-108.000.
Moore, James H., Jr.: *See*—
Westphal, Bernd A. K.; Moore, James H., Jr.; and Livingston, Richard G., 4,320,625, Cl. 60-646.000.
Moore, Joseph E. Method of producing color separation negatives using contrast reducing filter. 4,321,321, Cl. 430-356.000.
Mori, Hiroyuki: *See*—
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, 4,321,388, Cl. 546-291.000.
Morikawa, Haruyuki: *See*—
Ono, Hiroshi; Fujii, Hidetsugu; Morikawa, Haruyuki; and Fukui, Akito, 4,321,410, Cl. 564-67.000.
Morikawa, Teruo; and Murata, Shinji, to Canon Kabushiki Kaisha. Auxiliary exposure device for electrophotographic apparatus. 4,320,959, Cl. 355-11.000.
Morimura, Syoji; Toda, Toshimasa; and Kurumada, Tomoyuki, to Sankyo Company, Limited. Triazine derivatives. 4,321,374, Cl. 544-198.000.
Morita, Haruyuki; Kubota, Yuichi; and Imaoka, Yasuo, to TDK Electronics Co., Ltd. Magnetic powder for magnetic recording medium. 4,321,303, Cl. 428-404.000.
Morita, Toru: *See*—
Shimizu, Kazuo; and Morita, Toru, 4,321,338, Cl. 525-335.000.
Morozowich, Merle; and Bonkowski, Richard L., to Westinghouse Electric Corp. High-frequency transistor switch. 4,321,485, Cl. 307-300.000.
Morrison, Donald R. Motor powered rotary trowel. 4,320,986, Cl. 404-112.000.
Morrison, Howard J.; Breslow, Jeffrey D.; and Harper, Rex M., to Marvin Glass & Associates. Microprocessor controlled game. 4,320,901, Cl. 273-237.000.
Moses, Peter R.: *See*—
Bowden, William L.; and Moses, Peter R., 4,321,314, Cl. 429-50.000.
Moslener, Manfred, deceased; and by Gentemann, Gerhard A., administrator, to U.S. Philips Corporation. Method of manufacturing plastic-bonded anisotropic permanent magnets. 4,321,222, Cl. 264-24.000.
Motorola, Inc.: *See*—
Sarma, Kalluri R.; Rice, M. John, Jr.; Lesk, I. Arnold; and Nikirk, Roger G., 4,321,246, Cl. 423-350.000.
Mouret, Pierre; Lyaudet, Georges; Sialino, Angelo; and Berri, Rino, to Compagnie Generale des Matieres Nucleaires (COGEMA). Process for the treatment of alkaline liquors containing sulfate ions. 4,321,235, Cl. 423-7.000.
Mourier, Georges: *See*—
Boulanger, Philippe; Kaplan, Daniel; and Mourier, Georges, 4,320,716, Cl. 118-723.000.
Mowbray, Dorian F., to Lucas Industries Limited. Fuel pumping apparatus. 4,320,733, Cl. 123-501.000.
Mueller, Gary E. Optical filtering element including fluorescent material. 4,320,939, Cl. 351-44.000.
Mueller, Gary E.; and Ziebarth, Timothy D. Optical filtering element. 4,320,940, Cl. 351-44.000.
Mueller, Rudiger: *See*—
Kammermaier, Johann; Mueller, Rudiger; and Roedl, Peter, 4,320,655, Cl. 73-204.000.
Mueller, Theo: *See*—
Rebmann, Hans J.; and Mueller, Theo, 4,321,115, Cl. 204-67.000.
Mugge, Jan, to U.S. Philips Corporation. Toaster. 4,320,698, Cl. 99-334.000.
Muhlfeld, Horst: *See*—
Schuhmacher, Gunter; Freudenberg, Bertram; and Muhlfeld, Horst, 4,321,173, Cl. 525-453.000.
Muhrer, Merle E.: *See*—
Johanning, Gary L.; Muhrer, Merle E.; and Gaddy, Herschel J., 4,321,278, Cl. 426-69.000.
Muller, Anton; and Kromer, Peter, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Hook, especially safety load hook. 4,320,561, Cl. 24-241.0PS.
Muller, Helmut: *See*—
Rasberger, Michael; and Muller, Helmut, 4,321,218, Cl. 260-967.000.
Muller, Simon. Running training apparatus. 4,320,895, Cl. 272-70.000.
Murai, Yutaka: *See*—
Tsuchihashi, Michihiro; Itatani, Ryohei; Ryohko, Masatoshi; and Murai, Yutaka, 4,321,506, Cl. 315-35.000.
Murata, Eiji; Izumi, Hideaki; Sugawara, Atuko; and Okano, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Schottky barrier contact to compound semiconductor with three layer refractory metalization and high phosphorous content glass passivation. 4,321,612, Cl. 357-15.000.
Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,321,560, Cl. 331-99.000.
Murata, Shinji: *See*—
Morikawa, Teruo; and Murata, Shinji, 4,320,959, Cl. 355-11.000.
Muto, Naoki: *See*—
Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, 4,321,376, Cl. 544-277.000.
Myers, Herbert: *See*—
Farrauto, Robert J.; Williams, Joseph C.; and Myers, Herbert, 4,321,300, Cl. 428-332.000.
Naden, Rex A., to Texas Instruments Incorporated. Magnetic bubble memory chip with dedicated redundancy data section provided thereon. 4,321,693, Cl. 365-15.000.
Nagashima, Minematsu: *See*—
Hisashi, Mino; Matsukawa, Masao; and Nagashima, Minematsu, 4,321,309, Cl. 428-522.000.
Nagasu, Akira; Yamamoto, Yosimi; Nagata, Takeo; Uchida, Hiroyasu; and Sakurai, Yutaka, to Hitachi, Ltd. Pressure transducer. 4,321,578, Cl. 338-42.000.
Nagata, Takeo: *See*—
Nagasu, Akira; Yamamoto, Yosimi; Nagata, Takeo; Uchida, Hiroyasu; and Sakurai, Yutaka, 4,321,578, Cl. 338-42.000.
Nagatani, Kuniaki: *See*—
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, 4,321,388, Cl. 546-291.000.
Nagelkirk, Preston, to Herman Miller, Inc. Mobile file lid. 4,320,852, Cl. 220-331.000.
Nagelkirk, Robert A., to Herman Miller, Inc. Structural support system with load control. 4,320,935, Cl. 312-350.000.
Naka, Hiromitsu. Stair mat. 4,321,293, Cl. 428-60.000.
Naka, Hiromitsu. Stair mat. 4,321,294, Cl. 428-61.000.
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerating apparatus. 4,320,629, Cl. 62-198.000.
Nakahara, Yasushi. Process for placing concrete through high head. 4,321,223, Cl. 264-32.000.
Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,321,191, Cl. 524-285.000.
Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Programmable exposure control systems for a camera. 4,320,944, Cl. 354-23.00D.
Nakajo, Toshihiko; Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, to Fujitsu Limited. Frame unit for electronic communication devices. 4,321,654, Cl. 361-396.000.
Nakamizo, Keiichi: *See*—
Nishida, Hiroshi; Nakamizo, Keiichi; Inoue, Takemi; and Miyazaki, Takeshi, 4,320,713, Cl. 114-123.000.
Nakamori, Takashi; Matsumoto, Zensho; Matsushita, Kiyomi; Katoh, Masayoshi; and Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Occupant's knee protecting device. 4,320,909, Cl. 280-752.000.
Nakamura, Hiroaki: *See*—
Takiguchi, Daigaku; Itou, Eiji; Nakamura, Hiroaki; and Kumita, Izumi, 4,321,363, Cl. 536-18.000.
Nakamura, Kazuhisa: *See*—
Higuchi, Mitsuo; Nakamura, Kazuhisa; and Maeda, Kohichi, 4,321,489, Cl. 307-362.000.
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, to Matsushita Electric Industrial Co., Ltd. Coenzyme immobilized electrode. 4,321,123, Cl. 204-195.00B.
Nakamura, Koyo, to Nissan Motor Co., Ltd. Intake air density sensor for an internal combustion engine. 4,320,652, Cl. 73-30.000.
Nakamura, Shigeo: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,321,525, Cl. 323-281.000.

Nakamura, Tatuo: *See*—
Tamura, Takeo; and Nakamura, Tatuo, 4,320,554, Cl. 15-250.00B.
Nakamura, Tomio; and Doi, Shunichi, to Nitto Chemical Industry Co., Ltd. Process for producing N-substituted acrylamide or methacrylamide. 4,321,411, Cl. 564-135.000.
Nakano, Seizo: *See*—
Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.
Nakata, Shinobu: *See*—
Minamide, Seiko; Okuda, Makoto; Nakata, Shinobu; and Fukui, Tadahiro, 4,321,287, Cl. 427-157.000.
Nakayama, Masaharu: *See*—
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Namiki, Junji, to Nippon Electronics Co., Ltd. Digital equalizer for a cross-polarization receiver. 4,321,705, Cl. 375-14.000.
Nankai, Shiro: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,321,123, Cl. 204-195.00B.
Narang, Saran A.: *See*—
Wu, Ray J.; Bahl, Chander P.; and Narang, Saran A., 4,321,365, Cl. 536-27.000.
Nardi, Ronald V.; and Fernandes, Prabhavathi B. Process for detecting proteins specific to hypertension in mammals. 4,321,120, Cl. 204-180.00G.
Nashua Corporation: *See*—
Davis, Austin E.; Cormier, Raymond G.; and Coombs, Peter M., 4,320,961, Cl. 355-14.0SH.
Nassif, John: *See*—
Hawwass, Ebrahim; Hawwass, Hassan; Nassif, John; Cajal, Victor A.; and Krone, Kenneth T., 4,321,673, Cl. 364-412.000.
National Institute of Radiological Sciences: *See*—
Tanaka, Eiichi; Tomitani, Takehiro; Takami, Katsumi; and Ishimatsu, Kenji, 4,321,474, Cl. 250-551.000.
National Semiconductor Corporation: *See*—
Batinovich, Victor A., 4,320,865, Cl. 228-6.00A.
Norton, Robert H., 4,321,691, Cl. 365-8.000.
Quadri, Farooq M., 4,321,692, Cl. 365-15.000.
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P. Apparatus for electrochemical purification of contaminated liquids. 4,321,125, Cl. 204-273.000.
NB Jackets Company (a div. of Bell & Howell Co.): *See*—
Dorman, Isidore, 4,320,591, Cl. 40-398.000.
Neal, James G.; and Stafford, Warren J., to Caterpillar Tractor Co. Stabilized hose assembly for transmitting fluid. 4,320,783, Cl. 138-110.000.
Neely, Raymond J.: *See*—
Shein, Kyaw J.; and Neely, Raymond J., 4,320,702, Cl. 122-13.00A.
Neenan, John S. Method and apparatus for providing a pulsating air/-water jet. 4,320,541, Cl. 4-492.000.
Nestler, Heinz; and Schnippering, Friedhelm, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of partial hydrolysates of tetra-(2-alkoxyethyl) silicates. 4,321,401, Cl. 556-457.000.
Neu, Frank D.: *See*—
Jerome, Jonathan A.; Neu, Frank D.; and Faraghan, Geoffrey T., 4,321,622, Cl. 358-128.500.
Neuberg, Rainer; Matthies, Hans G.; and Druschke, Wolfgang, to BASF Aktiengesellschaft. Thermoplastic segmented elastomeric copolyether-esters and their use as pressure-sensitive adhesives. 4,321,341, Cl. 525-437.000.
Neuendorf, David W.: *See*—
Stambaugh, Edgel P.; and Neuendorf, David W., 4,321,236, Cl. 423-82.000.
Neumiller, Phillip J.: *See*—
Martens, Edward J., III; and Neumiller, Phillip J., 4,320,873, Cl. 239-6.000.
Newman, Donald J.: *See*—
Dunphy, Gerald F.; and Newman, Donald J., 4,320,638, Cl. 70-358.000.
Nichias Corporation: *See*—
Miyahara, Yoshihisa; Kobayashi, Kimimasa; Kobayashi, Yawara; and Harada, Tsuneo, 4,321,459, Cl. 219-544.000.
Nickel, Manfred; and Escherich, Karl H., to Kernforschungsanlage Julich GmbH. System for locating leaks in the liner of a pressure vessel equipped with cooling tubes. 4,321,110, Cl. 376-250.000.
Nicolau, Yves-Claude; and Gersonde, Klaus, to Studiengesellschaft Kohle mbH. Controlled improvement of the O_2-release by intact erythrocytes. 4,321,259, Cl. 424-101.000.
Nicolet, Charles F., to Standard Oil Company (Indiana). Extreme purification of sulfonic-type acids for processing to highly overbased metal sulfonates. 4,321,214, Cl. 260-504.00R.
Niederhauser, Michel: *See*—
Cuche, Claude; Jeanneret, Rene; and Niederhauser, Michel, 4,320,635, Cl. 66-220.000.
Nigrey, Paul J.: *See*—
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., 4,321,114, Cl. 204-2.100.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Tanaka, Yukihisa; and Ohashi, Shigeo, 4,321,442, Cl. 200-308.000.
Nikirk, Roger G.: *See*—
Sarma, Kalluri R.; Rice, M. John, Jr.; Lesk, I. Arnold; and Nikirk, Roger G., 4,321,246, Cl. 423-350.000.
Nippon Electric Co., Ltd.: *See*—
Igarashi, Hatsuhide, 4,321,562, Cl. 331-116.0FE.
Sakuma, Isamu, 4,321,556, Cl. 372-45.000.
Nippon Electronics Co., Ltd.: *See*—
Namiki, Junji, 4,321,705, Cl. 375-14.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,321,662, Cl. 363-86.000.
Nippon Kogaku K.K.: *See*—
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,320,971, Cl. 356-328.000.
Kimura, Makoto, 4,320,945, Cl. 354-23.00R.
Nippon Kokan Kabushiki Kaisha: *See*—
Honda, Akira; Kumagai, Shinobu; and Takita, Hiroyuki, 4,320,668, Cl. 73-863.110.
Nippon Oil and Fats Co., Ltd.: *See*—
Ohmura, Hiroshi; and Nakayama, Masaharu, 4,321,179, Cl. 524-599.000.
Nippon Precision Optical Instrument Co., Ltd.: *See*—
Sato, Ko, 4,320,978, Cl. 356-440.000.
Nippon Soda Company Limited: *See*—
Takiguchi, Daigaku; Itou, Eiji; Nakamura, Hiroaki; and Kumita, Izumi, 4,321,363, Cl. 536-18.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Takatsuki, Toshiharu; Fujiwara, Ken-ichi; Yanagisawa, Sinobu; and Okamura, Shigeru, 4,321,429, Cl. 179-2.0DP.
Nippon Zeon Co., Ltd.: *See*—
Ueda, Akio; Akita, Shuichi; Hirakawa, Hiroshi; and Ahagon, Asahiro, 4,321,168, Cl. 524-526.000.
Nishida, Hiroshi; Nakamizo, Keiichi; Inoue, Takemi; and Miyazaki, Takeshi, to Kawasaki Jukogyo Kabushiki Kaisha. Small watercraft. 4,320,713, Cl. 114-123.000.
Nishide, Hiroo: *See*—
Shimazaki, Shigeru; Uehara, Yasuhiro; and Nishide, Hiroo, 4,320,714, Cl. 118-60.000.
Nishikawa, Masaji; Kasuga, Muneo; and Funakubo, Tomoki, to Olympus Optical Company Ltd. Electrophotographic apparatus including a screen member for decreasing side edge electrostatic charge. 4,320,956, Cl. 355-3.0CH.
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Oscillator using dielectric resonator. 4,321,560, Cl. 331-99.000.
Nishimura, Sadanori. Control device for a torque converter in an automatic speed change gear for vehicles. 4,320,821, Cl. 192-3.310.
Nishimura, Takamasa: *See*—
Hashimoto, Koichi; and Nishimura, Takamasa, 4,320,634, Cl. 66-202.000.
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, to Ishihara Sangyo Kaisha Ltd. N-benzoyl N'-pyridyloxy phenyl urea. 4,321,388, Cl. 546-291.000.
Nishiyama, Toyoo: *See*—
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.
Nishizaki, Tadao: *See*—
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,321,224, Cl. 264-115.000.
Nishizuka, Akihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Cell capacity detector. 4,321,541, Cl. 324-426.000.
Nissan Motor Company, Limited: *See*—
Etoh, Yukihiro; and Tanaka, Toshiaki, 4,320,726, Cl. 123-198.00F.
Kawamoto, Tamio, 4,320,670, Cl. 74-477.000.
Kita, Toru, 4,320,650, Cl. 73-3.000.
Matsui, Katsuhiko, 4,321,136, Cl. 210-86.000.
Nakamori, Takashi; Matsumoto, Zensho; Matsushita, Kiyomi; Katoh, Masayoshi; and Matsuoka, Hideoki, 4,320,909, Cl. 280-752.000.
Nakamura, Koyo, 4,320,652, Cl. 73-30.000.
Okajima, Masao, 4,320,628, Cl. 62-186.000.
Takahashi, Kotei; Endo, Teruo; and Kawaguchi, Masayuki, 4,320,824, Cl. 192-115.000.
Tamura, Takeo; and Nakamura, Tatuo, 4,320,554, Cl. 15-250.00B.
Urasaki, Yoshio, 4,320,983, Cl. 403-139.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo, 4,320,624, Cl. 60-588.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Nakamura, Tomio; and Doi, Shunichi, 4,321,411, Cl. 564-135.000.
Nix, Paul T.; and Fields, Spencer, to Millipore Corporation. 4-Aminoantipyrine dye for the analytic determination of hydrogen peroxide. 4,321,397, Cl. 548-366.000.
Noda, Hiroto: *See*—
Ogawa, Hiroyasu; Nonaka, Kazuo; and Noda, Hiroto, 4,321,446, Cl. 219-10.49R.
Noji, Susumu: *See*—
Takeda, Yoshinobu; Kuroishi, Nobuhito; and Noji, Susumu, 4,321,091, Cl. 75-213.000.
Nonaka, Kazuo: *See*—
Ogawa, Hiroyasu; Nonaka, Kazuo; and Noda, Hiroto, 4,321,446, Cl. 219-10.49R.
Norddeutsche Affinerie Aktiengesellschaft: *See*—
Bartsch, Adalbert, 4,321,289, Cl. 427-287.000.
Norris, Thomas R., to United States of America, Army. Noise reduction in engine exhaust. 4,320,815, Cl. 181-226.000.
Northern Engineering Industries Limited: *See*—
Herrod, Clive A.; and Campbell, James G., 4,320,568, Cl. 29-421.00R.
Northrop Corporation: *See*—
Grohe, Lester R., 4,320,669, Cl. 74-5.370.

Norton, Robert H., to National Semiconductor Corporation. Redundant bubble detector. 4,321,691, Cl. 365-8.000.

Nosaka, Isao: *See—*
Seimiya, Ryubun; Shinozaki, Akira; Nosaka, Isao; and Iwai, Fumio, 4,320,952, Cl. 355-3.0SH.

Novak, John. Container repair spacer system. 4,321,000, Cl. 410-76.000.

Novak, Raymond F.; and Geist, Bernard W., to Duo-Fast Corporation. Muffler for fastener driving tool. 4,320,864, Cl. 227-130.000.

Nozu, Toshiro: *See—*
Tada, Hiroshi; Abe, Wataru; Nozu, Toshiro; and Ishikawa, Keizo, 4,320,548, Cl. 14-1.000.

Nugent, Edward L.: *See—*
Eichhorn, Edward C.; Nugent, Edward L.; and Megahed, Shenoda S., 4,320,769, Cl. 128-763.000.

Numata, Saburo, to Fuji Photo Optical Co., Ltd. Light measuring device. 4,321,462, Cl. 250-211.00J.

Oak Industries Inc.: *See—*
Larson, Willis A., 4,320,573, Cl. 29-622.000.

Obernberger, Klaus, to Bayerische Motoren Werke Aktiengesellschaft. Cooling system for liquid-cooled internal combustion engines. 4,320,798, Cl. 165-36.000.

Obertegger, Franz, to Durst AG Fabrik Fototechnischer Apparate. Light measuring apparatus incorporating means for shielding light sensor for predetermined minimum time. 4,320,976, Cl. 356-418.000.

Occidental Research Corporation: *See—*
DiGiacomo, Peter M., 4,321,133, Cl. 209-3.300.
Stover, Carole S.; and Compton, Leslie E., 4,321,465, Cl. 250-255.000.

Ochiai, Hirokazu: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,321,265, Cl. 424-246.000.

Octel S.A.: *See—*
Stirling, William; and Peres, Robert L., 4,320,775, Cl. 137-3.000.

Oda, Chikao: *See—*
Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, 4,321,344, Cl. 526-64.000.

Oda, Koiti; Kataoka, Yoshiro; and Sakaue, Takashi, to Sharp Kabushiki Kaisha. Electronic learning aid operable in an examination mode. 4,321,046, Cl. 434-201.000.

Oesterling, Erwin, to Hauni-Werke Korber & Co. KG. Apparatus for severing and shifting plugs for cigarettes or the like. 4,321,050, Cl. 493-45.000.

Officine Savio S.p.A.: *See—*
D'Agnolo, Armando, 4,320,563, Cl. 28-248.000.

Ogasawara, Fumihoro, to Ricoh Company, Limited. Image information reading system. 4,321,629, Cl. 358-294.000.

Ogawa, Hiroyasu; Nonaka, Kazuo; and Noda, Hiroto, to Toho Beslon Co., Ltd. Apparatus for production of graphite fibers. 4,321,446, Cl. 219-10.49R.

Ogawa, Yasuo: *See—*
Nishiyama, Ryuzo; Mori, Hiroyuki; Ogawa, Yasuo; Haga, Takahiro; and Nagatani, Kuniaki, 4,321,388, Cl. 546-291.000.

Ogden Industries Pty. Limited: *See—*
Dunphy, Gerald F.; and Newman, Donald J., 4,320,638, Cl. 70-358.000.

Ogston, Christine B.: *See—*
Jones, Stella S.; Ogston, Christine B.; and Webb, Robert L., 4,321,399, Cl. 549-70.000.

Ogura, Takashi: *See—*
Tomiyama, Tetsuo; and Ogura, Takashi, 4,321,058, Cl. 23-230.00B.

O'Hanlon, Edward J. Heavily insulated shelter structure. 4,320,604, Cl. 52-92.000.

Ohashi, Shigeo: *See—*
Tanaka, Yukihisa; and Ohashi, Shigeo, 4,321,442, Cl. 200-308.000.

Ohmi, Yasuo: *See—*
Hasegawa, Tatsuru; Ohmi, Yasuo; Ricketts, Guy A. G.; and Sime, Stuart J., 4,321,256, Cl. 424-70.000.

Ohmori, Taiji; and Sato, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Antiskid brake device. 4,321,676, Cl. 364-426.000.

Ohmura, Hiroshi; and Nakayama, Masaharu, to Nippon Oil and Fats Co., Ltd. Process for producing an aqueous liquid dispersion of polymers. 4,321,179, Cl. 524-599.000.

Ohnmacht, Helmut; and Meywald, Klaus, to Fritz Eichenauer, Firma. Electrical hot air appliance. 4,321,456, Cl. 219-364.000.

Ohori, Harumi: *See—*
Ishikawa, Masakazu; Ohori, Harumi; and Kiriyama, Takashi, 4,321,590, Cl. 340-515.000.

Ohsaki, Kozo; Zamma, Jun; Kobayasi, Yukihiro; and Watanabe, Hiroshi, to Toyo Engineering Corporation. Chemical process and apparatus therefor. 4,321,234, Cl. 422-200.000.

Ohsako, Kyoichi, to Laurel Bank Machine Co., Ltd. Bank note dispensing method and apparatus. 4,321,671, Cl. 364-405.000.

Ohshita, Hiroshi; and Tsutsumi, Tadao, to Toray Industries, Inc. Flame retardant polyamide molding resin containing melamine cyanurate finely dispersed therein. 4,321,189, Cl. 524-101.000.

Ohtsu Tire & Rubber Co., Ltd., The: *See—*
Fujii, Katsuhiko; Ueda, Minoru; and Minekawa, Hiroshi, 4,320,791, Cl. 152-362.00R.

Ohtsuka, Tsutomu, to Toshiba Kikai Kabushiki Kaisha. Apparatus for driving spindles of machine tools with induction motors. 4,321,516, Cl. 318-571.000.

Oiles Co., Ltd.: *See—*
Tada, Hiroshi; Abe, Wataru; Nozu, Toshiro; and Ishikawa, Keizo, 4,320,548, Cl. 14-1.000.

Okajima, Masao, to Nissan Motor Co., Ltd. Quick air cooling system for use with automotive vehicle air conditioner. 4,320,628, Cl. 62-186.000.

Okamura, Shigeru: *See—*
Takatsuki, Toshiharu; Fujiwara, Ken-ichi; Yanagisawa, Sinobu; and Okamura, Shigeru, 4,321,429, Cl. 179-2.0DP.

Okano, Susumu: *See—*
Murata, Eiji; Izumi, Hideaki; Sugawara, Atuko; and Okano, Susumu, 4,321,612, Cl. 357-15.000.

Oki Electric Industry Co., Ltd.: *See—*
Bise, Tomokazu, 4,321,616, Cl. 357-51.000.

Oksanen, Martti T.: *See—*
Haltsonen, Eino J.; and Oksanen, Martti T., 4,321,109, Cl. 162-274.000.

Okuda, Makoto: *See—*
Minamide, Seiko; Okuda, Makoto; Nakata, Shinobu; and Fukui, Tadahiro, 4,321,287, Cl. 427-157.000.

Okura Kogyo Kabushiki Kaisha: *See—*
Matsuda, Hideaki, 4,321,352, Cl. 528-115.000.

Okuyama, Katsuo: *See—*
Nakajo, Toshihiko; Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,321,654, Cl. 361-396.000.

Olmsted, John H., to RTE Corporation. Hydrocarbon electrical insulation oil containing tri-cresyl phosphate to increase water retention capability. 4,321,424, Cl. 174-17.0LF.

Olympus Optical Company Ltd.: *See—*
Fukuoka, Norio, 4,321,642, Cl. 360-137.000.
Nishikawa, Masaji; Kasuga, Muneo; and Funakubo, Tomoki, 4,320,956, Cl. 355-3.0CH.
Saito, Shoichi, 4,321,633, Cl. 360-69.000.
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.
Sato, Masaaki, 4,321,638, Cl. 360-96.500.
Tsunefuji, Katsuhiko, 4,321,570, Cl. 335-229.000.

Oncor Corporation: *See—*
Clark, Wallace; and Goldstein, Albert S., Jr., 4,320,929, Cl. 308-230.000.

Ondetti, Miguel A.: *See—*
Ryono, Denis E.; and Ondetti, Miguel A., 4,321,392, Cl. 548-215.000.

Ono, Hiroshi; Fujii, Hidetsugu; Morikawa, Haruyuki; and Fukui, Akito, to Mitsui Toatsu Chemicals, Inc.; and Toyo Engineering Corporation. Method of stripping unreacted materials in urea synthesis process. 4,321,410, Cl. 564-67.000.

Onoda Cement Co., Ltd.: *See—*
Itoh, Tsutomu, 4,321,281, Cl. 427-33.000.

Onuki, Kazuaki: *See—*
Umeki, Shinji; Hamabata, Toshihiro; Onuki, Kazuaki; and Takada, Kazuo, 4,321,302, Cl. 428-404.000.

Oonishi, Toshiyuki: *See—*
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,320,629, Cl. 62-198.000.

Optimas Bauelemente und Baugerate GmbH: *See—*
Kleinemas, Harald, 4,320,985, Cl. 404-99.000.

Orthomedics, Inc.: *See—*
Racette, Walter L.; and Porter, David L., 4,320,748, Cl. 128-80.00F.

Oshio, Hiromichi: *See—*
Konishi, Hiroyuki; Hashimoto, Shunichi; and Oshio, Hiromichi, 4,321,081, Cl. 71-88.000.

Ostreicher, Eugene A., to AMF Incorporated. Process of making an improved filter media. 4,321,288, Cl. 427-244.000.

Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, to Toyo Jozo Kabushiki Kaisha. Neplanocin-B and -F. 4,321,376, Cl. 544-277.000.

Otawa, Shuji: *See—*
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,519, Cl. 318-696.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,520, Cl. 318-696.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,521, Cl. 318-696.000.

Ott, Louis E., to Standard Oil Company (Indiana). Aqueous sulfur dispersion having reduced corrosive activity toward ferrous metal. 4,321,079, Cl. 71-61.000.

Oury, Ralph M. Concrete form systems and components thereof. 4,320,888, Cl. 249-45.000.

Ousterhout, Karl B., to Potomac Applied Mechanics, Inc. Leveling. 4,320,581, Cl. 33-388.000.

Owens-Corning Fiberglas Corporation: *See—*
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,321,074, Cl. 65-12.000.

Oxenrider, Bruce C.; and Mares, Frank, to Allied Corporation. N-Methylpyrrolidone solvent in esterification of carboxybenzenes. 4,321,403, Cl. 560-87.000.

Oy Wartsila AB: *See—*
Martikainen, Jaakko, 4,320,640, Cl. 70-366.000.

Oy Wiik & Hoglund AB: *See—*
Blomgvist, Harald, 4,321,292, Cl. 428-36.000.

Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, to Hitachi, Ltd. Enclosed-type zinc-oxide surge arrester. 4,321,651, Cl. 361-127.000.

Ozawa, Keiji: *See*—
Kinjo, Hisao; and Ozawa, Keiji, 4,321,621, Cl. 358-128.600.
PA Management Consultants Limited: *See*—
Dashwood, Nigel J. R.; and Plummer, Dexter R., 4,320,941, Cl. 352-111.000.
Paccar Inc.: *See*—
Middelhoven, Paul J., 4,320,814, Cl. 180-294.000.
Paddock, Dennis C.: *See*—
Cottrell, Terence B. F.; and Paddock, Dennis C., 4,321,068, Cl. 55-148.000.
Paessler, Ernst-Robert: *See*—
Tappeiner, Hermann; Paessler, Ernst-Robert; Smutny, Kurt; and Krugel, Karl-Heinz, 4,321,581, Cl. 340-310.00R.
Pagano, Raymond V. Weatherized housing assembly for camera. 4,320,949, Cl. 354-81.000.
Page, Robert E., to Beloit Corporation. Method of suppressing paper web flutter. 4,321,107, Cl. 162-198.000.
Pallos, Ferenc M., to Stauffer Chemical Company. N-Acyl-phenyl-thiourea herbicidal antidotes. 4,321,083, Cl. 71-99.000.
Panametrics, Inc.: *See*—
Lynnworth, Lawrence C.; Seger, John L.; and Bradshaw, James E., 4,320,659, Cl. 73-589.000.
Panek, Peter; Woditsch, Peter; and Kannchen, Werner, to Bayer Aktiengesellschaft. Treating hydrolysis residues from preparation of titanium dioxide. 4,321,237, Cl. 423-82.000.
Panigrahi, Godavarish; and Rege, Satish L., to Burroughs Corporation. Charge coupled device memory with enhanced access features. 4,321,694, Cl. 365-77.000.
Papantoniou, Christos: *See*—
Jacquet, Bernard; Papantoniou, Christos; Vanlerberghe, Guy; and Mondet, Jean, 4,321,348, Cl. 526-218.000.
Parg, Adolf; Wuerzer, Bruno; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Substituted N-benzoylanthranilic acid derivatives and their anhydro compounds. 4,321,371, Cl. 544-92.000.
Parham, Donald W., Jr.; and Tucker, John G., to Western Electric Company, Inc. Selectively winding strands on a support member. 4,320,876, Cl. 242-7.110.
Parker-Hannifin Corporation: *See*—
Jelinek, Jerry G., 4,321,225, Cl. 264-138.000.
Parker, William L.: *See*—
Sykes, Richard B.; and Parker, William L., 4,321,326, Cl. 435-121.000.
Parlman, Robert M.; Lee, Roy C.; and Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,321,061, Cl. 44-63.000.
Paros, Jerome M.; and Busse, Donald W., to Paroscientific, Inc. Longitudinal isolation system for flexually vibrating force transducers. 4,321,500, Cl. 310-321.000.
Paroscientific, Inc.: *See*—
Paros, Jerome M.; and Busse, Donald W., 4,321,500, Cl. 310-321.000.
Parsons, Raymond L.; and Paulsen, Paul H., to International Business Machines Corporation. Timing pulse generation. 4,321,687, Cl. 364-900.000.
Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Allesandro; Fumagalli, Angelo; Fanstini, Franco; and Ceserani, Roberto, 4,321,205, Cl. 260-346.220.
Pastva, John V., Jr., to Eastern Company, The. Paddle locks with handle disconnect features. 4,320,642, Cl. 70-472.000.
Patak, Richard J.: *See*—
Ledniczki, Ferenc; Patak, Richard J.; and Wayne, Ronald G., 4,321,479, Cl. 307-116.000.
Pate, Kevin T.: *See*—
Langer, Stanley H.; and Pate, Kevin T., 4,321,313, Cl. 429-13.000.
Patel, Kirit B.; and Gonsiorawski, Ronald, to Mobil Tyco Solar Energy Corporation. Nickel plating method. 4,321,283, Cl. 427-74.000.
Patel, Vithal K.: *See*—
Powell, David R.; and Patel, Vithal K., 4,321,263, Cl. 424-195.000.
Pateman, Edwin: *See*—
Wilkinson, Wilfred H.; Pateman, Edwin; Gale, Anthony G.; and Slinger, John, 4,321,010, Cl. 416-92.000.
Pauliukonis, Richard S. Universal momentary contact diverter. 4,320,782, Cl. 137-625.650.
Pauliukonis, Richard S. Metering pump. 4,321,021, Cl. 417-374.000.
Paulkovich, John: *See*—
Studer, Philip A.; and Paulkovich, John, 4,321,572, Cl. 336-83.000.
Paulsen, Paul H.: *See*—
Parsons, Raymond L.; and Paulsen, Paul H., 4,321,687, Cl. 364-900.000.
Pawelczyk, Adam: *See*—
Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, 4,321,077, Cl. 71-40.000.
Pawson, Beverly A.: *See*—
Chan, Ka-Kong; and Pawson, Beverly A., 4,321,209, Cl. 260-408.000.
Payne, Robert L.; and Reinke, Thomas R., to Honeywell Inc. Switch operated capacitive oscillator apparatus. 4,321,561, Cl. 331-111.000.
Pelazza, Andrea. Snowplow apparatus. 4,320,589, Cl. 37-42.0UL.
Pellegrino, Anthony: *See*—
Holland, William P.; and Pellegrino, Anthony, 4,321,471, Cl. 250-406.000.
Pennwalt Corporation: *See*—
Cushman, Robert H., 4,321,472, Cl. 250-439.00P.
PepsiCo Inc.: *See*—
Felix, Cristian J.; and Genaro, Donald M., 4,320,933, Cl. 312-223.000.
Perepezko, John H.; Rasmussen, Don H.; and Loper, Carl R., Jr., to Wisconsin Alumni Research Foundation. Preparation of micron sized metal droplets. 4,321,086, Cl. 75-0.50C.
Peres, Robert L.: *See*—
Stirling, William; and Peres, Robert L., 4,320,775, Cl. 137-3.000.
Pertici, Andrew L., to McGraw-Edison Company. Time delay dual element fuse with greater blowing time accuracy. 4,321,574, Cl. 337-165.000.
Peteri, Dezsoe: *See*—
Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,321,268, Cl. 424-266.000.
Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Push-type control valve for fluid actuator. 4,320,779, Cl. 137-492.500.
Peterson, William E.; Thompson, Robert B.; and Vasile, Carmine F., to Electric Power Research Institute, Inc. Electromagnetic acoustic transducer for tube inspection. 4,320,661, Cl. 73-643.000.
Petersson, Nils E., to AB Sture Ljungdahl. Envelope material for use in envelope producing machine. 4,320,868, Cl. 229-75.000.
Petiteau, Maurice R., to Societe Anonyme Sormel. Safety device for a pyrotechnic assembly. 4,320,705, Cl. 102-232.000.
Petrovic, Marko. Transistorized voltage limiter. 4,321,524, Cl. 323-229.000.
Pfizer Inc.: *See*—
Crawford, Thomas C., 4,321,196, Cl. 260-239.100.
Kadin, Saul B., 4,321,372, Cl. 544-133.000.
Vinick, Fredric J., 4,321,391, Cl. 548-183.000.
Philip Morris, Incorporated: *See*—
Chavdarian, Charles G.; and Sanders, Edward B., 4,321,387, Cl. 546-281.000.
Phillips Petroleum Company: *See*—
Allison, George M., III, 4,321,186, Cl. 523-139.000.
Bertus, Brent J.; and McKay, Dwight L., 4,321,129, Cl. 208-120.000.
Burns, Lyle D., 4,321,063, Cl. 44-74.000.
Carroll, James C.; and Johnson, Lewis T., 4,320,837, Cl. 206-505.000.
Cheng, Paul J., 4,321,248, Cl. 423-456.000.
Delgado, Emil, 4,321,216, Cl. 260-504.00S.
Hart, Peter J., 4,321,250, Cl. 423-652.000.
Parlman, Robert M.; Lee, Roy C.; and Burns, Lyle D., 4,321,061, Cl. 44-63.000.
Zelinski, Robert P., 4,321,358, Cl. 528-388.000.
Phillips, Wheeler E.: *See*—
Slattery, Ian; and Phillips, Wheeler E., 4,320,711, Cl. 112-79.00R.
Piber, Earl T., to Eaton Corporation. Lighted toggle lever switch having articulated conductors. 4,321,443, Cl. 200-315.000.
Pickard, Gordon W.; and Hayward, Ian, to British Gas Corporation. Electronic discrimination circuitry for the highest frequency of a plurality of input signals. 4,321,547, Cl. 328-133.000.
Pierce, Harold W. Fireplace heater stove. 4,320,741, Cl. 126-123.000.
Pierce, Linden W., to General Electric Company. Vaporization cooled transformer having a high voltage. 4,321,421, Cl. 174-11.00R.
Pietsch, Joseph A.: *See*—
Uselton, Robert B.; and Pietsch, Joseph A., 4,320,630, Cl. 62-238.600.
Pinck, Peter; Heitmann, Uwe; Baier, Anton; and Helms, Adolf, to Hauni-Werke Korber & Co. KG. Method and apparatus for treating wrapping material for cigarettes or the like. 4,320,773, Cl. 131-281.000.
Pioneer Electronic Corporation: *See*—
Honda, Satoru, 4,321,515, Cl. 318-6.000.
Piontkowski, Carl F., to C & D Distributors, Inc. Damper adjusting mechanism. 4,320,742, Cl. 126-289.000.
Pivovarov, Alexandr I.: *See*—
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.
Plastics Engineering Company: *See*—
D'Alelio, Gaetano F.; and Waitkus, Phillip A., 4,321,198, Cl. 260-326.00S.
Plavnik, Gennady Z.: *See*—
Bildjukevich, Viktor L.; Demidovich, Boris K.; Yakimovich, Dmitry T.; Turovsky, Leonid N.; Plavnik, Gennady Z.; Lebedkova, Valentina A.; Kupriyanenko, Anatoly P.; Kozlova, Sofya L.; and Pivovarov, Alexandr I., 4,321,239, Cl. 423-175.000.
Plummer, Dexter R.: *See*—
Dashwood, Nigel J. R.; and Plummer, Dexter R., 4,320,941, Cl. 352-111.000.
Plunguian, Mark: *See*—
Cornwell, Charles E.; and Plunguian, Mark, 4,321,243, Cl. 423-268.000.
Plunkett, Allan B.; and Turnbull, Fred G., to General Electric Company. Auxiliary power supply with kinetic energy storage. 4,321,478, Cl. 307-47.000.
Plymouth Products Incorporated: *See*—
Sokol, Louis, 4,321,660, Cl. 362-368.000.
Podunavac, Bozo. Guitar construction. 4,320,684, Cl. 84-291.000.
Pogoda, Gary S. Combined pick and tuner. 4,320,689, Cl. 84-454.000.
Pokalsky, Peter A.: *See*—
Cooper, Michael N.; and Pokalsky, Peter A., 4,321,586, Cl. 340-572.000.
Polaroid Corporation: *See*—
Eburn, William H., Jr.; and Kalenik, Stephen P., 4,321,014, Cl. 417-5.000.

Polhemus, Marlan H.; and Frye, Lonnie E. Desk accessory system. 4,320,835, Cl. 206-411.000.

Poliniak, Eugene S.: *See*—
Kaplan, Michael; Poliniak, Eugene S.; and Meyerhofer, Dietrich, 4,321,470, Cl. 250-398.000.

Politechnika Wroclawska: *See*—
Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, 4,321,077, Cl. 71-40.000.

Polymer Technology Corporation: *See*—
Ellis, Edward J.; and Salamone, Joseph C., 4,321,261, Cl. 424-180.000.

Polzer, Bernhard J.: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,320,806, Cl. 173-12.000.

Pomonik, George M., to Amtel, Inc. Easily removable fluid swivel for SALM buoy installation. 4,320,545, Cl. 441-4.000.

Pond, Stanley L.: *See*—
Brown, Leon C.; and Pond, Stanley L., 4,320,957, Cl. 355-3.0CH.

Popp, Karl, to Sulzer Brothers Limited. Measuring device for thread and a method of adjusting the length of a travelling thread. 4,320,786, Cl. 139-452.000.

Porta Systems Corp.: *See*—
De Luca, Paul V.; and Fasano, Michael, 4,321,650, Cl. 361-119.000.

Porteous, Don D., to Van R Dental Products, Inc. Braided gingival retraction cord. 4,321,038, Cl. 433-136.000.

Porter, David L.: *See*—
Racette, Walter L.; and Porter, David L., 4,320,748, Cl. 128-80.00F.

Potomac Applied Mechanics, Inc.: *See*—
Ousterhout, Karl B., 4,320,581, Cl. 33-388.000.

Powell, David R.; and Patel, Vithal K., to Rowell Laboratories, Inc. Psyllium compositions. 4,321,263, Cl. 424-195.000.

Pozdnyakova, Tamara M.: *See*—
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

PPG Industries, Inc.: *See*—
Brown, William J.; and Rowley, James R., 4,320,836, Cl. 206-451.000.
Castellucci, Nicholas T., 4,321,304, Cl. 428-418.000.
Castellucci, Nicholas T.; and Bosso, Joseph F., 4,321,305, Cl. 428-418.000.

Praun, Ferdinand v.: *See*—
Coenen, Alfred; Kosswig, Kurt; Praun, Ferdinand v.; and Regner, Hans, 4,321,247, Cl. 423-424.000.

Precision Governors, Inc.: *See*—
Meyer, Hal G., 4,321,571, Cl. 335-272.000.

Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J. Method and apparatus for coating submerged portions of floating structures. 4,321,101, Cl. 156-239.000.

Priesnitz, Uwe: *See*—
Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,321,408, Cl. 560-192.000.

Procter & Gamble Company, The: *See*—
Harris, Richard G.; and Gray, Ian, 4,321,157, Cl. 252-174.250.
McGrady, Joseph, 4,321,166, Cl. 252-542.000.
Smith, Rory J. M.; and McRitchie, Allan C., 4,321,165, Cl. 252-528.000.

Pryde, Everett H.: *See*—
Kai, Yoshinori; and Pryde, Everett H., 4,321,210, Cl. 260-409.000.

Puff, Roger M.: *See*—
Brice, Henri; Puff, Roger M.; and Kita, Jean-Claude, 4,321,032, Cl. 432-14.000.

Pulver, Steven M.: *See*—
Widiger, Alexander H., Jr.; Randall, Osro W., III; and Pulver, Steven M., 4,321,331, Cl. 521-32.000.

Puppel, Alfred; and Dalferth, Hans H. Chain conveyor. 4,320,827, Cl. 198-731.000.

Purdue Research Foundation: *See*—
Chen, Li F.; Gong, Cheng S.; and Tsao, George T., 4,321,327, Cl. 435-161.000.

Putney, Buddy S. Cable straightener. 4,320,649, Cl. 72-389.000.

Pyro-Sciences, Inc.: *See*—
Hladun, Kenneth W., 4,320,709, Cl. 110-235.000.

Pytlewski, Roger. Stringed musical instrument. 4,320,685, Cl. 84-291.000.

QSC Audio Products, Inc.: *See*—
Quilter, Patrick H., 4,321,554, Cl. 330-298.000.

Quadri, Farooq M., to National Semiconductor Corporation. Bubble memory system having defective minor loops. 4,321,692, Cl. 365-15.000.

Quemerais, Philippe: *See*—
Bouvet, Jean M.; and Quemerais, Philippe, 4,320,781, Cl. 137-625.650.

Queveau, Gerard. Articulated vehicle drive and control system. 4,320,811, Cl. 180-14.00A.

Quilter, Patrick H., to QSC Audio Products, Inc. Time-delayed, variable output current limiting means for power amplifiers. 4,321,554, Cl. 330-298.000.

Racette, Walter L.; and Porter, David L., to Orthomedics, Inc. Fracture brace. 4,320,748, Cl. 128-80.00F.

Racine Railroad Products, Inc.: *See*—
McIlrath, William P., 4,320,707, Cl. 104-1.00R.

Racky, Berthold: *See*—
Gesser, Gernot; Hauer, Franz; Racky, Berthold; and Klein, Dieter, 4,320,847, Cl. 220-67.000.

Radtke, Volker, to BASF Aktiengesellschaft. Preparation of insoluble metal complex colorants. 4,321,390, Cl. 548-109.000.

Ramu International: *See*—
Smith-Johannsen, Robert, 4,321,295, Cl. 428-206.000.

Randall, Osro W., III: *See*—
Widiger, Alexander H., Jr.; Randall, Osro W., III; and Pulver, Steven M., 4,321,331, Cl. 521-32.000.

Rao, Krishna K.: *See*—
Ryu, Ji-Yong; Rao, Krishna K.; Spohn, Ralph J.; and Drogin, Robert, 4,321,402, Cl. 560-24.000.

Rasberger, Michael; and Muller, Helmut, to Ciba-Geigy Corporation. Phosphite stabilizer. 4,321,218, Cl. 260-967.000.

Rasmussen, Don H.: *See*—
Perepezko, John H.; Rasmussen, Don H.; and Loper, Carl R., Jr., 4,321,086, Cl. 75-0.50C.

Raybestos-Manhattan, Inc.: *See*—
Covaleski, Stanley F., 4,320,823, Cl. 192-107.00M.

Rayburn, Robert L.: *See*—
Watson, Robert L.; and Rayburn, Robert L., 4,320,754, Cl. 128-204.250.

Raymond, Lawrence P., to Battelle Memorial Institute. Mass algal culture system. 4,320,594, Cl. 47-1.400.

Raytheon Company: *See*—
Rowland, Howard J.; and deBettencourt, Joseph T., 4,320,801, Cl. 166-248.000.
Sandy, Frank, 4,321,567, Cl. 333-196.000.
Tancrell, Roger H., 4,320,660, Cl. 73-626.000.

RCA Corporation: *See*—
Atherton, James H.; and Dreisbach, William C., 4,321,491, Cl. 307-475.000.
Gibson, Walter G.; and Liu, Frank C., 4,321,624, Cl. 358-195.100.
Hollingsworth, Richard J., 4,321,492, Cl. 307-530.000.
Hughes, Larry M., 4,321,702, Cl. 369-77.000.
Kaplan, Leonard A., 4,321,648, Cl. 361-101.000.
Kaplan, Michael; Poliniak, Eugene S.; and Meyerhofer, Dietrich, 4,321,470, Cl. 250-398.000.
Kipp, Ronald W., 4,321,602, Cl. 343-14.000.
Knight, Peter R., 4,321,513, Cl. 315-411.000.
Thibodeau, Leslie N.; Luz, David W.; and Hicks, James E., 4,321,514, Cl. 315-411.000.
Tuska, James W., 4,321,543, Cl. 324-433.000.
Valembois, Pierre V.; Deckert, Cheryl A.; and Holub, Edward J., 4,320,567, Cl. 29-407.000.
Willis, Donald H., 4,321,511, Cl. 315-387.000.

Rebmann, Hans J.; and Mueller, Theo, to Swiss Aluminium Ltd. Method and device for providing a continuous measured supply of alumina to an electrolytic cell. 4,321,115, Cl. 204-67.000.

Recchuite, Alexander D., to Suntech, Inc. Process of sulfurizing triglyceride and an olefin. 4,321,153, Cl. 252-48.600.

Redding, Robert J. Fluid flow measuring apparatus. 4,320,666, Cl. 73-861.280.

Redwine, Donald J.; and White, Lionel S., Jr., to Texas Instruments Incorporated. High speed serial access semiconductor memory with fault tolerant feature. 4,321,695, Cl. 365-174.000.

Refreshment Machinery Incorporated: *See*—
Shein, Kyaw J.; and Neely, Raymond J., 4,320,702, Cl. 122-13.00A.

Rege, Satish L.: *See*—
Panigrahi, Godavarish; and Rege, Satish L., 4,321,694, Cl. 365-77.000.

Regie Nationale des Usines Renault: *See*—
Bouvet, Jean M.; and Quemerais, Philippe, 4,320,781, Cl. 137-625.650.
Deleris, Robert, 4,321,580, Cl. 340-870.240.

Regner, Hans: *See*—
Coenen, Alfred; Kosswig, Kurt; Praun, Ferdinand v.; and Regner, Hans, 4,321,247, Cl. 423-424.000.

Rehn, Larry A.; and Tarpley, R. Wayne, to Texas Instruments Incorporated. Thermally compensated silicon pressure sensor. 4,320,664, Cl. 73-708.000.

Reichel, Hilmar; and Hoogen, Karl-Heinz, to Siemens Aktiengesellschaft. Apparatus for the display of frequency distributions of measured valves, or the like, over an adjustable measuring range. 4,321,528, Cl. 324-77.00D.

Reineke, Charles E., to Dow Chemical Company, The. Preparation of N-halo α,α-disubstituted β-lactams. 4,321,193, Cl. 260-239.00A.

Reinke, Thomas R.: *See*—
Payne, Robert L.; and Reinke, Thomas R., 4,321,561, Cl. 331-111.000.

Reisem, Daniel E.: *See*—
Baker, Leslie R.; and Reisem, Daniel E., 4,321,652, Cl. 361-209.000.

Reist, Walter; and Honegger, Werner, to Ferag AG. Apparatus for outfeeding flat products, especially printed products, arriving in an imbricated array. 4,320,894, Cl. 271-277.000.

Reliable Electric Company: *See*—
Gilberts, Alexander G., 4,321,649, Cl. 361-119.000.

Reliance Electric Company: *See*—
Huykman, Richard B., 4,321,487, Cl. 307-311.000.

Ren, Chung-Li: *See*—
Joyal, Francis G.; and Ren, Chung-Li, 4,321,568, Cl. 333-209.000.

Renault Vehicules: *See*—
Bouvet, Jean M.; and Quemerais, Philippe, 4,320,781, Cl. 137-625.650.

Rendall, David: *See—*
Forrester, John S.; and Rendall, David, 4,320,667, Cl. 73-862.640.
Resco Products, Inc.: *See—*
Jeffries, Ernest H., Jr., 4,320,612, Cl. 52-396.000.
Research Corporation: *See—*
Bobek, Miroslav V.; Bloch, Alexander; and Cheng, Yung-Chi, 4,321,366, Cl. 536-55.000.
Lenz, Robert W.; and Vert, Michel, 4,320,753, Cl. 128-156.000.
Wu, Ray J.; Bahl, Chander P.; and Narang, Saran A., 4,321,365, Cl. 536-27.000.
Research Lab Products, Inc.: *See—*
Saurino, Vincent R., 4,321,277, Cl. 424-329.000.
Resonant Technology Company: *See—*
Gurries, Raymond A., 4,320,807, Cl. 173-49.000.
Revlon, Inc.: *See—*
Levine, Sol; Kamen, Melvin E.; DeFazio, August; and Cueli, Peter, 4,321,087, Cl. 75-0.50A.
Rexroth, Klaus W. O., to Everex Corporation. Machine for making strudel leaf, dough sheets. 4,321,023, Cl. 425-66.000.
Reynolds Metals Company: *See—*
Benitez, Osiel H., 4,321,185, Cl. 524-363.000.
Reytblatt, Zinovy V. Fourier processor of photoelastic data and method of using same. 4,320,966, Cl. 356-34.000.
Rezabek, Karel: *See—*
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.
Rhodes, Melvin H., to Rockwell International Corporation. Magnetic field detection by differential phase lag. 4,321,536, Cl. 324-253.000.
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., to Acrison, Incorporated. Weigh feeding apparatus. 4,320,855, Cl. 222-56.000.
Rice, M. John, Jr.: *See—*
Sarma, Kalluri R.; Rice, M. John, Jr.; Lesk, I. Arnold; and Nikirk, Roger G., 4,321,246, Cl. 423-350.000.
Rich, Richard D., to Loctite Corporation. Accelerator for curable compositions. 4,321,349, Cl. 526-270.000.
Richards, Arthur W.: *See—*
Gordon, Hilton P.; Richards, Arthur W.; Hawkins, Albert P.; and Boyle, Alan, 4,320,841, Cl. 209-552.000.
Richards, George W., to Combustion Engineering, Inc. Distillation of crude oil. 4,321,132, Cl. 208-352.000.
Richardson, John R. Stabilizing structures against oscillation. 4,320,602, Cl. 52-1.000.
Richardson-Merrell Inc.: *See—*
Lundberg, Charles A., Jr.; and Farr, Robert A., 4,321,382, Cl. 546-95.000.
Richman, Donald, to United Technologies Corporation. Three dimensional, azimuth-correcting mapping radar. 4,321,601, Cl. 343-5.0CM.
Ricketts, Guy A. G.: *See—*
Hasegawa, Tatsuru; Ohmi, Yasuo; Ricketts, Guy A. G.; and Sime, Stuart J., 4,321,256, Cl. 424-70.000.
Ricoh Company, Ltd.: *See—*
Kakeno, Sadao, 4,321,608, Cl. 346-75.000.
Ogasawara, Fumihoro, 4,321,629, Cl. 358-294.000.
Satomi, Toyokazu, 4,320,963, Cl. 355-50.000.
Wada, Yoshinori, 4,321,626, Cl. 358-263.000.
Yoshiba, Yutaka, 4,321,599, Cl. 340-804.000.
Ricoh Watch Company, Limited: *See—*
Toyama, Nobuo; and Takahashi, Shigekazu, 4,321,699, Cl. 368-255.000.
Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,321,408, Cl. 560-192.000.
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Arrangement for fastening a structural part to a round steel chain. 4,320,620, Cl. 59-93.000.
Rieke Corporation: *See—*
Rieke, Mahlon E.; and Summers, Kenneth L., 4,320,861, Cl. 222-541.000.
Rieke, Mahlon E.; and Summers, Kenneth L., to Rieke Corporation. Molded plastic tamper-proof cap with pull ring and tearable membranes. 4,320,861, Cl. 222-541.000.
Rieser, Elmer P.: *See—*
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,321,074, Cl. 65-12.000.
Riken Corporation: *See—*
Miyahara, Yoshihisa; Kobayashi, Kimimasa; Kobayashi, Yawara; and Harada, Tsuneo, 4,321,459, Cl. 219-544.000.
Riseman, John H. Method and improved apparatus for obtaining temperature-corrected readings of ion levels and readings of solution temperature. 4,321,544, Cl. 324-438.000.
Ritter, Robert A. Multiple vessel cascade gas enrichment system. 4,321,069, Cl. 55-161.000.
Robbins, Wayne E.; Spivey, Paul R.; and Travis, Terence, to International Business Machines Corp. Add-on programs with code verification and control. 4,321,667, Cl. 364-200.000.
Robert Bosch GmbH: *See—*
Jeenicke, Edmund; Klotzner, Winfried; and Dilger, Peter, 4,321,548, Cl. 328-143.000.
Matthai, Gunter, 4,321,664, Cl. 363-141.000.
Mayer, Siegfried; and Altpeter, Arno, 4,320,984, Cl. 403-292.000.
Schnurle, Hans; Drews, Ulrich; and Werner, Peter, 4,320,732, Cl. 123-478.000.
Roberts, Scott C.: *See—*
Gwyn, John E.; and Roberts, Scott C., 4,320,795, Cl. 165-1.000.
Robertson, Allan J., to Cyanamid Canada, Inc. 2,4,4'-Trimethylpentyl, cyclohexylphosphinic acid and its preparation. 4,321,213, Cl. 260-502.40R.
Robichaud, Arthur W.: *See—*
Dye, Richard G.; and Robichaud, Arthur W., 4,320,848, Cl. 220-72.000.
Robinson, Eric, to Carus Chemical Company. Treatment of gaseous effluent. 4,321,240, Cl. 423-210.000.
Roccaforte, Harry I., to Champion International Corporation. Carton having pivotable platform. 4,320,830, Cl. 206-45.190.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Pull-out guide for drawers. 4,320,934, Cl. 312-331.000.
Rockwell International Corporation: *See—*
Dugan, John M., 4,321,483, Cl. 307-269.000.
McNutt, Michael J., 4,321,584, Cl. 340-347.0DA.
Rhodes, Melvin H., 4,321,536, Cl. 324-253.000.
Rocroi, Jean-Pierre: *See—*
Gole, Francois; and Rocroi, Jean-Pierre, 4,321,540, Cl. 324-357.000.
Rodak, John J.; and Rodak, Regina E. Door draft device. 4,320,598, Cl. 49-481.000.
Rodak, Regina E.: *See—*
Rodak, John J.; and Rodak, Regina E., 4,320,598, Cl. 49-481.000.
Roeder, George K. Downhole, hydraulically actuated pump assembly with pressure settable packer nose assembly. 4,321,015, Cl. 417-56.000.
Roedl, Peter: *See—*
Kammermaier, Johann; Mueller, Rudiger; and Roedl, Peter, 4,320,655, Cl. 73-204.000.
Rogers, Bernard T. Inflatable equipment for use as a bouyant boom. 4,320,991, Cl. 405-68.000.
Rogers, Edward C.; and Edwards, Derek R., to BICC Limited. Busbar installation. 4,321,422, Cl. 174-15.00C.
Rogers, Kenneth G. Mechanical toothbrush. 4,320,774, Cl. 132-11.00A.
Rohde, Wolfgang: *See—*
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.
Rohr Industries, Inc.: *See—*
Grace, Thad N.; Folmer, Carroll W.; and Logan, Douglas W., 4,320,912, Cl. 292-341.180.
Rohr, Wolfgang: *See—*
Eicken, Karl; Rohr, Wolfgang; and Linhart, Friedrich, 4,321,395, Cl. 548-253.000.
Rolls-Royce Limited: *See—*
Wilkinson, Wilfred H.; Pateman, Edwin; Gale, Anthony G.; and Slinger, John, 4,321,010, Cl. 416-92.000.
Roloff, Achim: *See—*
Ehrenfreund, Josef; and Roloff, Achim, 4,321,276, Cl. 424-322.000.
Romano, Albert P., to Du Pont de Nemours, E. I., and Company. Process for surface improvement of surprint proof involves exposure thru halftone screen tint. 4,321,320, Cl. 430-290.000.
Roncaglione, James W. Angled side brush vehicle washing apparatus. 4,320,551, Cl. 15-53.00A.
Rooney, John M., to W. R. Grace & Co. Polyisobutylene/phenol polymers treated with diisocyanates and poly(oxyalkylene)polyols. 4,321,343, Cl. 525-534.000.
Roos, Axel S. O., to Sandvik Aktiebolag. Cutoff tool. 4,320,996, Cl. 407-103.000.
Rose, Robert C.: *See—*
Leis, Michael D.; and Rose, Robert C., 4,321,632, Cl. 360-49.000.
Rothele, Stephan: *See—*
Leschonski, Kurt; and Rothele, Stephan, 4,321,134, Cl. 209-30.000.
Rothwell, Harold L., Jr.: *See—*
English, George J.; Rothwell, Harold L., Jr.; and Keeffe, William M., 4,321,501, Cl. 313-197.000.
Keeffe, William M.; Rothwell, Harold L., Jr.; and Scholz, John A., 4,321,504, Cl. 313-214.000.
Rotter, Siegfried: *See—*
Hajek, Josef; Rotter, Siegfried; Schwopfinger, Hans; and Schwarz, Josef, 4,321,051, Cl. 493-439.000.
Rougier, Gilles, to Saint-Gobain Industries. Glazing laminates with integral electrical network. 4,321,296, Cl. 428-212.000.
Routt, Wilson M., Jr.: *See—*
Hooker, Ross B., III; and Routt, Wilson M., Jr., 4,321,627, Cl. 358-286.000.
Rowe, Murray A.; Glesmann, Herbert C.; and Ulmer, Ewald, to CMI Corporation. Concrete vibrator machine. 4,320,987, Cl. 404-115.000.
Rowell Laboratories, Inc.: *See—*
Powell, David R.; and Patel, Vithal K., 4,321,263, Cl. 424-195.000.
Rowland, Howard J.; and deBettencourt, Joseph T., to Raytheon Company. In situ processing of organic ore bodies. 4,320,801, Cl. 166-248.000.
Rowley, James R.: *See—*
Brown, William J.; and Rowley, James R., 4,320,836, Cl. 206-451.000.
Rowley, Paul R., to Atlantic Richfield Company. Sea life habitat apparatus. 4,320,717, Cl. 119-4.000.
Roy, Pradip K.; Feldbrugge, Alonzo H. R.; and Bresnahan, David P., to General Foods Corporation. Textured oil seed protein products. 4,321,280, Cl. 426-276.000.
RTE Corporation: *See—*
Lien, Wayne W., 4,321,576, Cl. 337-202.000.
Olmsted, John H., 4,321,424, Cl. 174-17.0LF.

Ruckle, Duane L.: *See*—
Ulion, Nicholas E.; and Ruckle, Duane L., 4,321,310, Cl. 428-612.000.
RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See*—
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., 4,320,620, Cl. 59-93.000.
Rudd, Edward H., to Magni-Power Company. Magnetic separator. 4,320,842, Cl. 209-636.000.
Rupp, Kenneth R. Simulated log corner units for erecting log cabin type structures. 4,320,610, Cl. 52-233.000.
Rusbach, Maurice, to Sarmac S.A. Percussion head fuse for an explosive projectile. 4,320,706, Cl. 102-249.000.
Russell, James T., to Digital Recording Corporation. Optical track segment intercept apparatus. 4,321,700, Cl. 369-44.000.
Rychlik, Alan F., executor: *See*—
Rychlik, Frank J., deceased; and Rychlik, Alan F., executor, 4,320,725, Cl. 123-188.00M.
Rychlik, Frank J., deceased; and Rychlik, Alan F., executor. Puffing swirler. 4,320,725, Cl. 123-188.00M.
Ryding, Paul A.: *See*—
Glassman, Stephen M.; Kice, James D.; and Ryding, Paul A., 4,320,722, Cl. 119-96.000.
Ryohko, Masatoshi: *See*—
Tsuchihashi, Michihiro; Itatani, Ryohei; Ryohko, Masatoshi; and Murai, Yutaka, 4,321,506, Cl. 315-35.000.
Ryono, Denis E.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of 4-oxazolidine-carboxylic acids. 4,321,392, Cl. 548-215.000.
Ryu, Ji-Yong; Rao, Krishna K.; Spohn, Ralph J.; and Drogin, Robert, to Exxon Research & Engineering Co. Carbamate process. 4,321,402, Cl. 560-24.000.
Rzeszewski, Theodore S., to Matsushita Electric Corp. of America. Auxiliary television signal system. 4,321,623, Cl. 358-144.000.
S. C. Johnson & Son, Inc.: *See*—
Bushman, Donald W., 4,321,156, Cl. 252-142.000.
Martens, Edward J., III; and Neumiller, Phillip J., 4,320,873, Cl. 239-6.000.
Sackin, Milton; Edison, David M.; and Thompson, Francis T., to Westinghouse Electric Corp. Protective relay apparatus. 4,321,681, Cl. 364-492.000.
Sado, Ichiro; and Matsuyama, Shigeru, to Canon Kabushiki Kaisha. Electronic equipment capable of statistic processing. 4,321,688, Cl. 364-900.000.
Saft, Gilbert. Wearing apparel. 4,320,538, Cl. 2-102.000.
Sahadevan, Velayudhan. Preparation of directly iodinated steroid hormones and related compounds. 4,321,208, Cl. 260-397.300.
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. 7α-Methoxycephalosporins. 4,321,265, Cl. 424-246.000.
Saint-Gobain Industries: *See*—
Rougier, Gilles, 4,321,296, Cl. 428-212.000.
Saint Gobain Vitrage: *See*—
Dran, Maurice; Dages, Daniel; and Le Gravier, Serge, 4,321,418, Cl. 136-251.000.
Saito, Isao; Hirosawa, Makoto; and Sakamoto, Seiya, to Dainippon Screen Seizo Kabushiki Kaisha. Control method and device for reproducing a halftone dot cut away along a picture outline. 4,321,631, Cl. 358-298.000.
Saito, Shoichi, to Olympus Optical Co. Ltd. Tape recorder. 4,321,633, Cl. 360-69.000.
Saito, Tetsu: *See*—
Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, 4,321,376, Cl. 544-277.000.
Saitoh, Hiroshi: *See*—
Aida, Masaaki; Kobayashi, Takashi; and Saitoh, Hiroshi, 4,320,564, Cl. 29-33.00L.
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, to Olympus Optical Co., Ltd. Tape cassette drive assembly. 4,320,879, Cl. 242-189.000.
Sakamaki, Hisashi: *See*—
Ishida, Masato; Maeshima, Katsuyoshi; and Sakamaki, Hisashi, 4,320,964, Cl. 355-69.000.
Sakamoto, Masakatsu; and Uchida, Kenji, to Hitachi, Ltd. Apparatus for continuous slurry displacement transfer. 4,321,016, Cl. 417-63.000.
Sakamoto, Seiya: *See*—
Saito, Isao; Hirosawa, Makoto; and Sakamoto, Seiya, 4,321,631, Cl. 358-298.000.
Sakane, Toshio: *See*—
Hosoe, Kazuya; Tsunekawa, Tokuichi; Masunaga, Makoto; and Sakane, Toshio, 4,320,948, Cl. 354-31.000.
Sakaue, Takashi: *See*—
Oda, Koiti; Kataoka, Yoshiro; and Sakaue, Takashi, 4,321,046, Cl. 434-201.000.
Sakowicz, Jerome K.: *See*—
Schopf, Larry D.; Sakowicz, Jerome K.; and Trenk, Hugh L., 4,321,279, Cl. 426-106.000.
Sakuma, Isamu, to Nippon Electric Co., Ltd. Semiconductor laser. 4,321,556, Cl. 372-45.000.
Sakurai, Yutaka: *See*—
Nagasu, Akira; Yamamoto, Yosimi; Nagata, Takeo; Uchida, Hiroyasu; and Sakurai, Yutaka, 4,321,578, Cl. 338-42.000.
Salamone, Joseph C.: *See*—
Ellis, Edward J.; and Salamone, Joseph C., 4,321,261, Cl. 424-180.000.
Salvatori, Tito: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Salvatori, Tito, 4,321,190, Cl. 524-252.000.
Salvino, Carmen M. Bowling ball. 4,320,899, Cl. 273-63.00E.
Sanders, Anne A.: *See*—
Argo, Dorothy P.; and Sanders, Anne A., 4,321,095, Cl. 134-6.000.
Sanders, Edward B.: *See*—
Chavdarian, Charles G.; and Sanders, Edward B., 4,321,387, Cl. 546-281.000.
Sandoz, Inc.: *See*—
Wareing, James R., 4,321,269, Cl. 424-267.000.
Sandstrom, Paul H.: *See*—
Henderson, James N.; and Sandstrom, Paul H., 4,321,171, Cl. 526-84.000.
Sandvik Aktiebolag: *See*—
Roos, Axel S. O., 4,320,996, Cl. 407-103.000.
Sandy, Frank, to Raytheon Company. Combining series sections weighting with withdrawal weighting in SAW transducers. 4,321,567, Cl. 333-196.000.
Sangamo Weston, Inc.: *See*—
Kelly, Austin T.; Emile, Philip, Jr.; and Stolpen, Alan H., 4,321,530, Cl. 324-115.000.
Marshall, Jay K., 4,321,531, Cl. 324-142.000.
Sankyo Company, Limited: *See*—
Morimura, Syoji; Toda, Toshimasa; and Kurumada, Tomoyuki, 4,321,374, Cl. 544-198.000.
Sano, Jun-ichi, to GTE Laboratories Incorporated. Apparatus for charging a capacitor. 4,321,661, Cl. 363-60.000.
Sanofi: *See*—
Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, 4,321,266, Cl. 424-246.000.
Sanyo Electric Co., Ltd.: *See*—
Shirasaka, Susumu, 4,321,587, Cl. 340-381.000.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Hisashi, Mino; Matsukawa, Masao; and Nagashima, Minematsu, 4,321,309, Cl. 428-522.000.
Shimizu, Kazuo; and Morita, Toru, 4,321,338, Cl. 525-335.000.
Sapino, Anthony P.: *See*—
Fidler, Thomas D.; and Sapino, Anthony P., 4,321,609, Cl. 346-75.000.
Sarkis, Joseph E. Flying amusement device. 4,320,593, Cl. 46-74.00D.
Sarma, Kalluri R.; Rice, M. John, Jr.; Lesk, I. Arnold; and Nikirk, Roger G., to Motorola, Inc. Polycrystalline silicon production. 4,321,246, Cl. 423-350.000.
Sarmac S.A.: *See*—
Rusbach, Maurice, 4,320,706, Cl. 102-249.000.
Sartorius GmbH: *See*—
Knothe, Erich; and Blawert, Dieter, 4,320,809, Cl. 177-243.000.
Sato, Akihiro; Tachibana, Masami; and Kikuta, Kazutsune, to Chisso Corporation. Method for producing α-olefin polymers. 4,321,345, Cl. 526-115.000.
Sato, Katsuhiko: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,519, Cl. 318-696.000.
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Sato, Ko, to Sato, Ko; and Nippon Precision Optical Instrument Co., Ltd. Integration sphere type turbidimeter. 4,320,978, Cl. 356-440.000.
Sato, Makoto: *See*—
Ohmori, Taiji; and Sato, Makoto, 4,321,676, Cl. 364-426.000.
Sato, Masaaki, to Olympus Optical Company Limited. Superminiature cassette tape recorder. 4,321,638, Cl. 360-96.500.
Sato, Ryuichi: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,321,273, Cl. 424-287.000.
Satoh, Hiroshi: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,321,273, Cl. 424-287.000.
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Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.
Satoh, Masaki: *See*—
Kasuga, Masao; Satoh, Masaki; and Matsushige, Takashi, 4,321,685, Cl. 364-724.000.
Satomi, Toyokazu, to Ricoh Co., Ltd. Original feeding system. 4,320,963, Cl. 355-50.000.
Saunders, Charles A., IV. Turn signal subassembly for use in combination with handlebar mounted breakaway motorcycle windscreen. 4,320,906, Cl. 280-289.00S.
Saurino, Vincent R., to Research Lab Products, Inc. Germicidal use of compositions containing certain quaternary ammonium compounds. 4,321,277, Cl. 424-329.000.
Savin Corporation: *See*—
Schultes, Max; and Eberlein, Dietmar, 4,320,953, Cl. 355-3.0SH.

Sawada, Daisaku; Shigematsu, Takashi; and Takeda, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for controlling ignition timing in engine. 4,320,729, Cl. 123-425.000.

Sawada, Yoshio: *See*—
Aoki, Harumi; Miyata, Katsuhiko; and Sawada, Yoshio, 4,320,946, Cl. 354-25.000.

Sawamura, Mitsuharu, to Canon Kabushiki Kaisha. Far ultraviolet dielectric multilayer film. 4,320,936, Cl. 350-1.600.

Sawdai, Joseph: *See*—
Klippstein, Karl H.; Sawdai, Joseph; Schacht, Charles A.; and Schilling, Charles G., 4,320,582, Cl. 34-39.000.

Sayles, David C., to United States of America, Army. Prevention of ammonia formation in rocket motors and laser pumping systems. 4,320,621, Cl. 60-214.000.

Scarola, Leonard S.: *See*—
Blakeslee, Theodore R., III; Kurtz, Stuart J.; Scarola, Leonard S.; Miller, John C.; Engle, James D.; and Horner, Jerome T., 4,321,229, Cl. 264-349.000.

Schacht, Charles A.: *See*—
Klippstein, Karl H.; Sawdai, Joseph; Schacht, Charles A.; and Schilling, Charles G., 4,320,582, Cl. 34-39.000.

Schaeffer, Friedrich K.; and Brennan, Thomas F., to General Electric Company. Bonded transposed transformer winding cable strands having improved short circuit withstand. 4,321,426, Cl. 174-34.000.

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Schatzler, Walter, to Webasto-Werk W. Baier GmbH & Co. Sliding roof for motor vehicles. 4,320,921, Cl. 296-213.000.

Schaub, Stanley R.; and Van Vliet, Peter. Failure detection analyzer. 4,320,662, Cl. 73-660.000.

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Scheler, Siegfried, to Hoechst Aktiengesellschaft. 2-Hydroxy-3-naphthoic acid amides. 4,321,373, Cl. 544-159.000.

Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, to Merz & Co. Certain substituted phenyl esters of nicotinic acid, compositions and methods of using same. 4,321,268, Cl. 424-266.000.

Schilling, Charles G.: *See*—
Klippstein, Karl H.; Sawdai, Joseph; Schacht, Charles A.; and Schilling, Charles G., 4,320,582, Cl. 34-39.000.

Schlegel Corporation: *See*—
Sterner, Maurice E., Jr., 4,320,597, Cl. 49-449.000.

Schlumberger Technology Corporation: *See*—
Timmons, John P., 4,321,670, Cl. 364-300.000.
Upchurch, James M., 4,320,800, Cl. 166-106.000.

Schmelzer Corporation: *See*—
Benjamin, Benjamin C., 4,320,693, Cl. 92-13.600.

Schmidt, Adolf; and Clarenz, Werner, to Bayer Aktiengesellschaft. Copolymer dispersions. 4,321,175, Cl. 524-555.000.

Schmidt, Lothar: *See*—
Voigt, Carl; Schmidt, Lothar; and Kleinschmit, Peter, 4,321,059, Cl. 23-232.00R.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Compositions, process and systems. 4,321,369, Cl. 542-415.000.

Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,320,771, Cl. 131-276.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,321,164, Cl. 252-522.00R.

Schmolka, Irving R., to BASF Wyandotte Corporation. Heavy duty liquid detergent compositions containing alkoxylated alkylene diamines and fatty acids. 4,321,167, Cl. 252-548.000.

Schneider, Clayton J., Jr., to Calspan Corporation. Aerosol can static electrometer. 4,321,546, Cl. 324-457.000.

Schnippering, Friedhelm: *See*—
Nestler, Heinz; and Schnippering, Friedhelm, 4,321,401, Cl. 556-457.000.

Schnurle, Hans; Drews, Ulrich; and Werner, Peter, to Robert Bosch GmbH. Method and apparatus for generating fuel injection control pulses for an internal combustion engine. 4,320,732, Cl. 123-478.000.

Schoch, Werner; Kroener, Michael; and Widder, Rudi, to BASF Aktiengesellschaft. Preparation of aromatic aldehydes by the Sommelet reaction. 4,321,412, Cl. 568-436.000.

Scholz, John A.: *See*—
Keeffe, William M.; Rothwell, Harold L., Jr.; and Scholz, John A., 4,321,504, Cl. 313-214.000.

Schopf, Larry D.; Sakowicz, Jerome K.; and Trenk, Hugh L., to General Foods Corporation. Buttered table syrup in polyolefin bottle. 4,321,279, Cl. 426-106.000.

Schorn, Kurt: *See*—
Zabrocki, Karl; Dhein, Rolf; Weider, Franz; Hohne, Klaus; and Schorn, Kurt, 4,321,170, Cl. 524-285.000.

Schossler, Werner: *See*—
Heinemann, Otto; Lucke, Helmut; Schossler, Werner; Heiringhoff, Burkhard; and Krumme, Helmut, 4,320,926, Cl. 308-9.000.

Schreier, Wilford R., to Marmon Company. Envelope generating circuit for an electronic musical instrument. 4,320,682, Cl. 84-1.260.

Schroder, Ernst; and Wermuth, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit system for the generation of a direct control voltage which is dependent on an alternating voltage. 4,321,482, Cl. 307-262.000.

Schrodter, Klaus: *See*—
Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, 4,321,245, Cl. 423-321.00S.

Schroeder, Jerzy; Gorecki, Henryk; Lewandowski, Mieczyslaw; Pawelczyk, Adam; and Kuzko, Antoni, to Politechnika Wroclawska. Method of preparation of multicomponent fertilizers. 4,321,077, Cl. 71-40.000.

Schroeder, Russell G., II: *See*—
Ward, Joseph W.; and Schroeder, Russell G., II, 4,320,960, Cl. 355-14.00R.

Schuhmacher, Gunter; Freudenberg, Bertram; and Muhlfeld, Horst, to Carl Freudenberg, Firma. Method for the preparation of finely dispersed polyurethane ureas. 4,321,173, Cl. 525-453.000.

Schultes, Max; and Eberlein, Dietmar, to Savin Corporation. Pick-off device for electrostatic copier. 4,320,953, Cl. 355-3.0SH.

Schultze-Rhonhof, Ernst: *See*—
Edel, Wilhelm; Heindl, Reinhold; Isenhardt, Friedel; and Schultze-Rhonhof, Ernst, 4,321,457, Cl. 219-497.000.

Schuss, Werner; and Klose, Hans J., to Siemens Aktiengesellschaft. Dental handpiece. 4,321,039, Cl. 433-82.000.

Schuster, John D.: *See*—
Kramer, Joseph O.; Young, Otto V.; Banner, Charles E.; and Schuster, John D., 4,320,826, Cl. 198-425.000.

Schuwerk, Fritz. Rotatable motor vehicle mirror. 4,320,937, Cl. 350-62.000.

Schwaderer, John R.: *See*—
Kristof, Mark J.; and Schwaderer, John R., 4,321,445, Cl. 219-10.55C.

Schwaertzel, Heinz; and Unterberger, Hans, to Siemens Aktiengesellschaft. Transmission system for telecopying and electronic transmission of in-house mail. 4,321,703, Cl. 370-89.000.

Schwarz, Alois; and Mautz, Karlheinz, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Headpiece support for rotor of a rotary wing aircraft. 4,321,013, Cl. 416-244.00R.

Schwarz, Josef: *See*—
Hajek, Josef; Rotter, Siegfried; Schwopfinger, Hans; and Schwarz, Josef, 4,321,051, Cl. 493-439.000.

Schweizer, Edward E.: *See*—
Miller, Alan; Schweizer, Edward E.; and Campanello, John, 4,321,040, Cl. 433-102.000.

Schwopfinger, Hans: *See*—
Hajek, Josef; Rotter, Siegfried; Schwopfinger, Hans; and Schwarz, Josef, 4,321,051, Cl. 493-439.000.

Scientific Applications Incorporated: *See*—
Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., 4,320,605, Cl. 52-94.000.

Scott, Michael A.; and Brown, Albert E., to International Business Machines Corporation. Process for producing transfer ribbons. 4,321,286, Cl. 427-152.000.

Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. Optically active tert-alkyl 7-(2-oxo-5-carbonyloxypyrrolidinyl) heptanoates. 4,321,201, Cl. 260-326.430.

Seal, James C. Spreader/grader. 4,320,988, Cl. 404-118.000.

Seanor, Donald A.: *See*—
Eddy, Clifford O.; and Seanor, Donald A., 4,321,033, Cl. 432-60.000.

Seda, Miroslav: *See*—
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.

See, Benito: *See*—
Maresca, Louis M.; Matzner, Markus; and See, Benito, 4,321,355, Cl. 528-180.000.

Segawa, Takashi, to Shimano Industrial Company, Limited. Inter housing speed transmission hub for bicycles. 4,320,672, Cl. 74-750.00B.

Seger, John L.: *See*—
Lynnworth, Lawrence C.; Seger, John L.; and Bradshaw, James E., 4,320,659, Cl. 73-589.000.

Seifert, Eberhard, to Sulzer Brothers Limited. Mounting for a tension beam. 4,320,784, Cl. 139-114.000.

Seikagaku Kogyoco Ltd.: *See*—
Tomiyama, Tetsuo; and Ogura, Takashi, 4,321,058, Cl. 23-230.00B.

Seimiya, Ryubun; Shinozaki, Akira; Nosaka, Isao; and Iwai, Fumio, to Konishiroku Photo Industry Co., Ltd. Sheet transport in electrophotographic copying apparatus. 4,320,952, Cl. 355-3.0SH.

Seitz, Michael E. A., to Standard Register Company, The. Moisture-set color developer ink. 4,321,093, Cl. 106-21.000.

Seki, Kunio, to Hitachi, Ltd. Acoustic monolithic power semiconductor integrated circuit and acoustic system using the same. 4,321,428, Cl. 179-1.00A.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Emulsion polymerization in water-insoluble polyol. 4,321,176, Cl. 524-555.000.

Select Technology Corporation: *See*—
Audelo, Alexander P., 4,321,124, Cl. 204-202.000.

Semonsky, Miroslav: *See*—
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.

Senbokuya, Mitsuaki: *See*—
Koshikawa, Yukio, 4,321,682, Cl. 364-520.000.

Seneviratne, Padmasiri D.: *See*—
Abbott, Roderick K.; Seneviratne, Padmasiri D.; and Juhasz, Daniel P., 4,320,915, Cl. 294-96.000.

Seno, Eugene T.: *See*—
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,321,361, Cl. 536-17.00R.
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,321,362, Cl. 536-17.00R.

Senuma, Michio; Sugiura, Yoji; and Shimada, Fumio, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Electromagnetically driven shutter. 4,320,950, Cl. 354-235.000.

Sertich, Anthony T. Dental drill with magnetic air turbine having magnetic bearings. 4,320,927, Cl. 308-10.000.

Shaffer, Don L., to Siemens-Allis, Inc. Insulating bearing and method of manufacture. 4,320,931, Cl. 308-237.00R.

Shaffer, John W.: *See*—
Brower, Boyd G.; and Shaffer, John W., 4,320,572, Cl. 29-832.000.

Shaffer, Robert C.; and Tarasen, William L., to Hitco. Carbon fabrics sequentially resin coated with (1) a metal-containing composition and (2) a boron-containing composition are laminated and carbonized. 4,321,298, Cl. 428-242.000.

Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,321,176, Cl. 524-555.000.

Shamah, Daniel: *See*—
Bertrand, John; Flink, Joseph H.; Shamah, Daniel; and Hosking, Rodger H., 4,321,680, Cl. 364-485.000.

Sharon, Arthur A. Portable oven. 4,320,736, Cl. 126-19.00M.

Sharp Kabushiki Kaisha: *See*—
Oda, Koiti; Kataoka, Yoshiro; and Sakaue, Takashi, 4,321,046, Cl. 434-201.000.

Shaty, Pavel P.: *See*—
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P., 4,321,125, Cl. 204-273.000.

Sheehan, Gerard M.; and Knapp, Donald E., to American Cyanamid Company. Grinding of titaniferous ores to enhance recovery of titanium dioxide. 4,321,152, Cl. 252-1.000.

Shein, Kyaw J.; and Neely, Raymond J., to Refreshment Machinery Incorporated. Steam generator. 4,320,702, Cl. 122-13.00A.

Shell Internationale Research Maatchappij: *See*—
Collins, Michael H., 4,320,654, Cl. 73-40.700.

Shell Oil Company: *See*—
Chatterjee, Ananda M., 4,321,334, Cl. 524-579.000.
Gwyn, John E.; and Roberts, Scott C., 4,320,795, Cl. 165-1.000.

Shelton, William S.: *See*—
Meyer, Danny S.; and Shelton, William S., 4,320,890, Cl. 251-328.000.

Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., to Honeywell Information Systems Inc. Data processing system having centralized data alignment for I/O controllers. 4,321,665, Cl. 364-200.000.

Shibata, Akira: *See*—
Hirose, Koichi; and Shibata, Akira, 4,321,618, Cl. 358-8.000.

Shibata, Takanori: *See*—
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Shibata, Tutomu: *See*—
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.

Shida, Masaharu: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,519, Cl. 318-696.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,321,520, Cl. 318-696.000.
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Shida, Shigeru: *See*—
Yasuda, Ken-ichi; and Shida, Shigeru, 4,320,643, Cl. 72-8.000.

Shigematsu, Takashi: *See*—
Sawada, Daisaku; Shigematsu, Takashi; and Takeda, Yuji, 4,320,729, Cl. 123-425.000.

Shimada, Fumio: *See*—
Senuma, Michio; Sugiura, Yoji; and Shimada, Fumio, 4,320,950, Cl. 354-235.000.

Shimano Industrial Company, Limited: *See*—
Segawa, Takashi, 4,320,672, Cl. 74-750.00B.

Shimazaki, Shigeru; Uehara, Yasuhiro; and Nishide, Hiroo, to Fuji Xerox Co., Ltd. Heat fixing device. 4,320,714, Cl. 118-60.000.

Shimizu, Kazuo; and Morita, Toru, to Sanyo-Kokusaku Pulp Co., Ltd. Novel chlorinated polymer and coating composition employing the same. 4,321,338, Cl. 525-335.000.

Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, to Sumitomo Chemical Company, Limited. Method for production of spherical molded product containing titanium oxide. 4,321,224, Cl. 264-115.000.

Shimoda, Misao: *See*—
Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; Nishiyama, Toyoo; Shimoda, Misso; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,320,879, Cl. 242-189.000.

Shimooka, Riyo; Atoji, Hitomi; Yamazaki, Takeshi; and Kunisawa, Masuo, to Dainippon Screen Seizo Kabushiki Kaisha. Color scanner for plate making. 4,321,620, Cl. 358-75.000.

Shindo, Katsuji: *See*—
Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.

Shinohara, Hironobu: *See*—
Yoshida, Yoshinori; and Shinohara, Hironobu, 4,321,409, Cl. 560-244.000.

Shinozaki, Akira: *See*—
Seimiya, Ryubun; Shinozaki, Akira; Nosaka, Isao; and Iwai, Fumio, 4,320,952, Cl. 355-3.0SH.

Shiozawa, Kaoru; and Matsunaga, Tsunebumi, to Kajima Corporation; and Mitsui Engineering & Shipbuilding Co., Ltd. Method of and apparatus for welding metal bars. 4,321,448, Cl. 219-57.000.

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Ozawa, Jun; Akatsu, Yoshi; Shindo, Katsuji; Mizukoshi, Akio; Nakano, Seizo; Maruyama, Seiichi; and Shirakawa, Shingo, 4,321,651, Cl. 361-127.000.

Shirasaka, Susumu, to Sanyo Electric Co., Ltd. Display unit with a removable indicator panel. 4,321,587, Cl. 340-381.000.

Shoji, Akio: *See*—
Arimoto, Shunji; Shoji, Akio; Takezawa, Shoichiro; Ishikawa, Noboru; and Takeda, Hirofumi, 4,321,335, Cl. 525-116.000.

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Sholin, Albert F.: *See*—
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

Shy, Min C. Insulated bucket with air pump. 4,320,859, Cl. 222-401.000.

Sialino, Angelo: *See*—
Mouret, Pierre; Lyaudet, Georges; Sialino, Angelo; and Berri, Rino, 4,321,235, Cl. 423-7.000.

Sibley, Henry C., to General Signal Corp. Electronic track current switching relay system. 4,320,880, Cl. 246-34.00R.

Sidote, George J.: *See*—
Sung, Rodney L.; and Sidote, George J., 4,321,060, Cl. 44-53.000.

Siebert, Werner: *See*—
Galow, Manfred; Dahl, Klaus; Rohde, Wolfgang; Habermehl, Diethard; Kucharzyk, Werner; and Siebert, Werner, 4,321,112, Cl. 202-241.000.

Siemens Aktiengesellschaft: *See*—
Grieger, Gerhard; and Bohrdt, Joaquin, 4,321,435, Cl. 200-82.00B.
Hess, Rudiger; and Marin, Heiner, 4,321,439, Cl. 200-148.00A.
Kammermaier, Johann; Mueller, Rudiger; and Roedl, Peter, 4,320,655, Cl. 73-204.000.
Macmillan, Richard, 4,321,669, Cl. 364-200.000.
Reichel, Hilmar; and Hoogen, Karl-Heinz, 4,321,528, Cl. 324-77.00D.
Schuss, Werner; and Klose, Hans J., 4,321,039, Cl. 433-82.000.
Schwaertzel, Heinz; and Unterberger, Hans, 4,321,703, Cl. 370-89.000.
Tappeiner, Hermann; Paessler, Ernst-Robert; Smutny, Kurt; and Krugel, Karl-Heinz, 4,321,581, Cl. 340-310.00R.
Warnest, Albert; and Ebnet, Friedrich, 4,321,573, Cl. 337-78.000.

Siemens-Allis, Inc.: *See*—
Shaffer, Don L., 4,320,931, Cl. 308-237.00R.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-7a-homo-PGI$_1$ compounds. 4,321,203, Cl. 260-345.200.

Sih, John C.: *See*—
Axen, Udo F.; and Sih, John C., 4,321,370, Cl. 542-426.000.

Silcox, Wayne E. Animal watering apparatus. 4,320,721, Cl. 119-73.000.

Sime, Stuart J.: *See*—
Hasegawa, Tatsuru; Ohmi, Yasuo; Ricketts, Guy A. G.; and Sime, Stuart J., 4,321,256, Cl. 424-70.000.

Simmonds, Charles W.; and Ardin, Dennis B. Power factor metering device. 4,321,529, Cl. 324-83.00R.

Simon, Avi, to Beta Engineering & Development Ltd. Clamping-type holder. 4,320,914, Cl. 294-88.000.

Singer Company, The: *See*—
Johnson, Ralph E., 4,320,712, Cl. 112-184.000.
Kron, Gerald J., 4,321,044, Cl. 434-59.000.
Ljung, Bo H. G., 4,320,974, Cl. 356-350.000.
Warner, Richard C., 4,321,598, Cl. 340-782.000.

Singh, Sadanand. Apparatus and method for audiometric assessment. 4,321,427, Cl. 179-1.00N.

Sipos, Tibor, to Johnson & Johnson. Potentiated medicaments. 4,321,257, Cl. 424-80.000.

Skaggs, Boyd T., to Container Corporation of America. Packaging insert. 4,320,839, Cl. 206-591.000.

SKF Kugellagerfabriken GmbH: *See*—
Winter, Heinrich, 4,320,930, Cl. 308-234.000.

Slattery, Ian; and Phillips, Wheeler E., to Spencer Wright Industries, Inc. Tufting apparatus for forming loop and cut pile. 4,320,711, Cl. 112-79.00R.

Slentz, Gale E.: *See*—
Howk, Max E.; Slentz, Gale E.; and Grillot, Ronald E., 4,321,555, Cl. 331-1.00A.

Slinger, John: *See*—
Wilkinson, Wilfred H.; Pateman, Edwin; Gale, Anthony G.; and Slinger, John, 4,321,010, Cl. 416-92.000.

Slobbe, Walter W.: *See*—
Hawxhurst, Margaret H.; and Slobbe, Walter W., 4,321,149, Cl. 210-720.000.

Smerz, Otto; Martini, Thomas; Billenstein, Siegfried; and Adrian, Klaus, to Hoechst Aktiengesellschaft. Use of alkylpolyglycol-tert.-butyl ether as bleaching auxiliary and bleaching baths containing this agent. 4,321,052, Cl. 8-107.000.

Smiley, Robert A., to Du Pont de Nemours, E. I., and Company. Treatment of dibasic esters with alkali metal borohydrides. 4,321,407, Cl. 560-191.000.

Smith, J. Guy, to Venmar, Inc. Chimney ventilating cap. 4,320,697, Cl. 98-68.000.

Smith, James R.: *See—*
Bryant, Floyd C.; and Smith, James R., 4,320,544, Cl. 7-158.000.

Smith-Johannsen, Robert, to Ramu International. Modified graphite and process for using same. 4,321,295, Cl. 428-206.000.

Smith, Malcolm S., to Du Pont de Nemours, E. I., and Company. Ionic hydrocarbon polymers having improved adhesion to nylon. 4,321,337, Cl. 525-329.000.

Smith, Richard D. Granular bed air heater. 4,320,796, Cl. 165-1.000.

Smith, Rory J. M.; and McRitchie, Allan C., to Procter & Gamble Company, The. Detergent compositions comprising cationic, anionic and nonionic surfactants. 4,321,165, Cl. 252-528.000.

Smith, William V., to Lectrolarm Custom Systems, Inc. Control system for plurality of video cameras. 4,321,625, Cl. 358-210.000.

Smithern, Earl D.: *See—*
Stoehr, Steven M.; Hannula, Fred W.; Dumaine, Thomas J.; Batting, Robert D.; and Smithern, Earl D., 4,321,027, Cl. 425-216.000.

SmithKline Corporation: *See—*
Ali, Fadia E., 4,321,254, Cl. 424-40.000.
Jones, Stella S.; Ogston, Christine B.; and Webb, Robert L., 4,321,399, Cl. 549-70.000.
Labaw, Clifford S.; and Webb, Robert L., 4,321,393, Cl. 548-222.000.
Weinstock, Joseph, 4,321,195, Cl. 260-239.0BB.

Smutny, Kurt: *See—*
Tappeiner, Hermann; Paessler, Ernst-Robert; Smutny, Kurt; and Krugel, Karl-Heinz, 4,321,581, Cl. 340-310.00R.

Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa s.p.a.: *See—*
Aldemaro, Ciaperoni; and Alberto, Cappelli, 4,321,188, Cl. 524-720.000.

Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,321,252, Cl. 424-28.000.

Sobole, Jean Claude, to Societe Bourguignonne de Mecanique. Filter for removing dust from a gaseous fluid. 4,321,071, Cl. 55-320.000.

Societe Anonyme Automobiles Citroen: *See—*
Dore', Jacques P., 4,320,632, Cl. 64-21.000.

Societe Anonyme Sormel: *See—*
Petiteau, Maurice R., 4,320,705, Cl. 102-232.000.

Societe Bourguignonne de Mecanique: *See—*
Sobole, Jean Claude, 4,321,071, Cl. 55-320.000.

Societe de Telecommunications Electronique Aeronetique et Maritime "TEAM": *See—*
Bouvrande, Andre M., 4,321,655, Cl. 362-29.000.

Societe d'Exploitation des Establishments Minato: *See—*
Van de Caveye, Yves H., 4,321,028, Cl. 425-217.000.

Societe Europeene de Propulsion: *See—*
Ledru, Francois, 4,321,154, Cl. 252-62.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,320,903, Cl. 277-22.000.

Sokol, Louis, to Plymouth Products Incorporated. Universal trouble light. 4,321,660, Cl. 362-368.000.

Sokolov, Alexandr K.: *See—*
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

Sol, Nicole: *See—*
Kaplan, Daniel; Sol, Nicole; and Landouar, Pierre, 4,321,420, Cl. 136-255.000.

Solar-Kist Corporation: *See—*
Binks, Chester J., 4,320,699, Cl. 99-349.000.

Solender, Peter E.: *See—*
Eglowstein, Ira; and Solender, Peter E., 4,321,689, Cl. 364-900.000.

Sommeria, Marcel R., to Theleme Corporation. Digital resolver. 4,321,684, Cl. 364-602.000.

Sorg, Helmut: *See—*
Ilk, Emil; and Sorg, Helmut, 4,321,075, Cl. 65-27.000.

Sottolana, Giulio. Insole, in particular for ladies' shoes. 4,320,588, Cl. 36-24.500.

South African Inventions Development Corporation: *See—*
Strasheim, Albertus; and Thain, Eberhard M., 4,320,972, Cl. 356-328.000.

Spector, George: *See—*
Bhitiyakul, Somsak; and Spector, George, 4,320,745, Cl. 128-11.000.

Speedie, Robert, to Illinois Tool Works Inc. Tube clamp. 4,320,557, Cl. 17-1.00R.

Spencer Wright Industries, Inc.: *See—*
Slattery, Ian; and Phillips, Wheeler E., 4,320,711, Cl. 112-79.00R.

Sperry Corporation: *See—*
Mittal, Faquir C., 4,321,020, Cl. 417-320.000.

Sphere Investments Limited: *See—*
Gordon, Hilton P.; Richards, Arthur W.; Hawkins, Albert P.; and Boyle, Alan, 4,320,841, Cl. 209-552.000.

Spivey, Paul R.: *See—*
Robbins, Wayne E.; Spivey, Paul R.; and Travis, Terence, 4,321,667, Cl. 364-200.000.

SPOFA, United Pharmaceutical Works: *See—*
Cerny, Antonin; Semonsky, Miroslav; Kotva, Rudolf; Rezabek, Karel; Auskova, Marie; and Seda, Miroslav, 4,321,380, Cl. 546-67.000.

Spohn, Ralph J.: *See—*
Ryu, Ji-Yong; Rao, Krishna K.; Spohn, Ralph J.; and Drogin, Robert, 4,321,402, Cl. 560-24.000.

Sprague, Peter W., to E. R. Squibb & Sons, Inc. Heterobicyclo intermediates. 4,321,383, Cl. 546-113.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of 2-oxabicyclooctane derivative in augmenting or enhancing the aroma or taste of smoking tobaccos and smoking tobacco articles. 4,320,771, Cl. 131-276.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2,4,6-Trimethylcyclohexanemethanol and derivatives, process for preparing same and organoleptic uses thereof. 4,321,164, Cl. 252-522.00R.

SRI International: *See—*
Buttrill, Sidney E., Jr., 4,321,467, Cl. 250-288.000.

Srivastava, Gopal K., to Zenith Radio Corporation. Sample and hold detector. 4,321,488, Cl. 307-353.000.

Stachowicz, Edward, to BMS Roasting Equipment Corporation. Barbecue fork holder. 4,320,700, Cl. 99-421.0HV.

Stafford, Warren J.: *See—*
Neal, James G.; and Stafford, Warren J., 4,320,783, Cl. 138-110.000.

Stambaugh, Edgel P.; and Neuendorf, David W., to Kerr-McGee Chemical Corporation. Process for beneficiating titaniferous materials. 4,321,236, Cl. 423-82.000.

Stamicarbon, B.V.: *See—*
Guffens, Joseph H. M.; and Van Gunsi, Christiaan A., 4,321,162, Cl. 252-511.000.

Stamper, James F.: *See—*
Knoke, Silas J.; and Stamper, James F., 4,320,817, Cl. 182-126.000.

Standard Brands Incorporated: *See—*
Maselli, John A.; and Horwath, Robert O., 4,321,323, Cl. 435-105.000.
Maselli, John A.; and Horwath, Robert O., 4,321,324, Cl. 435-105.000.

Standard Oil Company: *See—*
Farrington, Diane G.; and White, James F., 4,321,160, Cl. 252-437.000.

Standard Oil Company (Indiana): *See—*
Keske, Robert G.; and Stephens, James R., 4,321,357, Cl. 528-350.000.
McAbery, James W., 4,321,215, Cl. 260-504.00S.
Nicolet, Charles F., 4,321,214, Cl. 260-504.00R.
Ott, Louis E., 4,321,079, Cl. 71-61.000.

Standard Register Company, The: *See—*
Seitz, Michael E. A., 4,321,093, Cl. 106-21.000.

Standex International Corporation: *See—*
Melonio, Christ H.; and Layfield, Gilbert P., 4,321,105, Cl. 156-660.000.

Stanley, Louis, to Card-O-Matic Pty. Limited. Apparatus for fabricating electrical equipment. 4,320,645, Cl. 72-132.000.

Staplin, Theodore R., Jr.: *See—*
Shen, Jian-Kuo; Bradley, John J.; King, Richard L.; Miller, Robert C.; Miu, Ming T.; and Staplin, Theodore R., Jr., 4,321,665, Cl. 364-200.000.

Starr, Jerry, to Biohumus, Inc. Composition and method for stimulation of aerobic bacteria. 4,321,142, Cl. 210-610.000.

Stauffer Chemical Company: *See—*
Pallos, Ferenc M., 4,321,083, Cl. 71-99.000.
Thomas, Victor M.; and Mahoney, Martin D., 4,321,084, Cl. 71-100.000.

Stauffer, Randy C.: *See—*
Davis, Ralph A.; and Stauffer, Randy C., 4,321,054, Cl. 8-621.000.

Stecher, Samuel J. Low frequency laser fiberoptic detector apparatus for musical instruments and intrusion detection. 4,321,463, Cl. 250-227.000.

Stein, Dieter W.: *See—*
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,320,806, Cl. 173-12.000.

Steiner, Hansruedi; and Erbsland, Arnold, to Widmer & Ernst AG. Grate mechanism for incinerating furnaces. 4,320,710, Cl. 110-281.000.

Steinmetz, Richard J.: *See—*
Alvord, Robert J.; Beaumont, Gregory J.; and Steinmetz, Richard J., 4,321,512, Cl. 315-411.000.

Stephens, James R.: *See—*
Keske, Robert G.; and Stephens, James R., 4,321,357, Cl. 528-350.000.

Sterling Drug Inc.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,321,369, Cl. 542-415.000.

Sterner, Maurice E., Jr., to Schlegel Corporation. Window latch. 4,320,597, Cl. 49-449.000.

Steuernagel, Walter: *See—*
Gupner, Otto; and Steuernagel, Walter, 4,321,067, Cl. 55-135.000.

Stewart, Herbert M.; and La Fevor, Jack W., to Aladdin Industries, Incorporated. Spherical vacuum insulated container. 4,320,856, Cl. 222-131.000.

Stirling, William; and Peres, Robert L., to Associated Octel Company Limited, The; and Octel S.A. Liquid metering unit responsive to the weight of the metered liquid. 4,320,775, Cl. 137-3.000.

Stirn, Richard J.: *See*—
United States of America, National Aeronautics and Space Administration; Stirn, Richard J.; and Yeh, Yea-Chuan M., 4,321,099, Cl. 148-175.000.

Stodola, George J. Christmas tree spacer. 4,320,886, Cl. 248-523.000.

Stoehr, Steven M.; Hannula, Fred W.; Dumaine, Thomas J.; Batting, Robert D.; and Smithern, Earl D., to Leesona Corporation. Under the press granulator construction. 4,321,027, Cl. 425-216.000.

Stolle, William H.; and Duderstadt, John C., to Mike Roberts Color Productions. Punch and [illegible]ling machine. 4,320,547, Cl. 11-1.0AC.

Stolpen, Alan H.: *See*—
Kelly, Austin T.; Emile, Philip, Jr.; and Stolpen, Alan H., 4,321,530, Cl. 324-115.000.

Storage Technology Corporation: *See*—
Touchton, James J.; and Hill, John P., 4,321,517, Cl. 318-618.000.

Story, Alfred D.: *See*—
Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., 4,320,558, Cl. 17-42.000.

Stover, Carole S.; and Compton, Leslie E., to Occidental Research Corporation. Infrared assay of kerogen in oil shale. 4,321,465, Cl. 250-255.000.

Strangman, Thomas E., to United Technologies Corporation. Columnar grain ceramic thermal barrier coatings. 4,321,311, Cl. 428-623.000.

Strasheim, Albertus; and Thain, Eberhard M., to South African Inventions Development Corporation. Vacuum spectrometer having a number of remotely positionable narrow wavelength detectors. 4,320,972, Cl. 356-328.000.

Streed, Clifford P. Geothermal livestock waterer. 4,320,720, Cl. 119-73.000.

Strickland, James N.: *See*—
Tomlin, Jerry B.; and Strickland, James N., 4,320,777, Cl. 137-315.000.

Stringham, Roger S.: *See*—
Toy, Madeline S.; and Stringham, Roger S., 4,321,359, Cl. 528-397.000.

Studer, Philip A.; and Paulkovich, John, to United States of America, National Aeronautics and Space Administration. Non-contacting power transfer device. 4,321,572, Cl. 336-83.000.

Studiengesellschaft Kohle mbH: *See*—
Nicolau, Yves-Claude; and Gersonde, Klaus, 4,321,259, Cl. 424-101.000.

Su, Tien K.: *See*—
Kluger, Edward W.; and Su, Tien K., 4,321,353, Cl. 528-120.000.

Su, Tien-Kuei: *See*—
Kluger, Edward W.; Su, Tien-Kuei; and Thompson, Teresa J., 4,321,354, Cl. 528-122.000.

Sugawara, Atuko: *See*—
Murata, Eiji; Izumi, Hideaki; Sugawara, Atuko; and Okano, Susumu, 4,321,612, Cl. 357-15.000.

Suginuma, Atsushi: *See*—
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Sugiura, Kyoji: *See*—
Kimura, Kaora; and Sugiura, Kyoji, 4,321,180, Cl. 524-549.000.

Sugiura, Yoji: *See*—
Senuma, Michio; Sugiura, Yoji; and Shimada, Fumio, 4,320,950, Cl. 354-235.000.

Sugiyama, Kengo: *See*—
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, 4,321,679, Cl. 364-474.000.

Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., to American Home Products Corporation. Antihypertensive agents. 4,321,384, Cl. 546-123.000.

Sullaway, Bob L.: *See*—
Baldridge, Morris G.; Knox, Lloyd C.; and Sullaway, Bob L., 4,320,992, Cl. 405-223.000.

Sulzer Brothers Limited: *See*—
Popp, Karl, 4,320,786, Cl. 139-452.000.
Seifert, Eberhard, 4,320,784, Cl. 139-114.000.

Sumitani, Tomoaki; Masaki, Yasunori; Furukawa, Tokinobu; Inoue, Yukio; and Oda, Chikao, to Hitachi, Ltd. Continuous bulk polymerization of thermoplastic resins. 4,321,344, Cl. 526-64.000.

Sumitomo Chemical Company, Limited: *See*—
Konishi, Hiroyuki; Hashimoto, Shunichi; and Oshio, Hiromichi, 4,321,081, Cl. 71-88.000.
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,321,224, Cl. 264-115.000.
Suzuki, Yukio; Hirano, Masachika; and Aketa, Koichi, 4,321,212, Cl. 260-465.00D.

Sumitomo Electric Industries, Ltd.: *See*—
Takeda, Yoshinobu; Kuroishi, Nobuhito; and Noji, Susumu, 4,321,091, Cl. 75-213.000.

Summers, Kenneth L.: *See*—
Rieke, Mahlon E.; and Summers, Kenneth L., 4,320,861, Cl. 222-541.000.

Sun, Evelyn L.; and Sun, Robert J., to Suntex Products, Inc. Acupressure method. 4,320,760, Cl. 128-303.00R.

Sun, Robert J.: *See*—
Sun, Evelyn L.; and Sun, Robert J., 4,320,760, Cl. 128-303.00R.

Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Substituted chromans. 4,321,270, Cl. 424-267.000.

Sundstrand Corporation: *See*—
Thom, James B.; and Ejzak, Richard P., 4,321,645, Cl. 361-63.000.
Wefel, Jerry D., 4,321,493, Cl. 310-68.00D.

Sung, Rodney L.; and Sidote, George J., to Texaco Inc. Novel process and product. 4,321,060, Cl. 44-53.000.

Suntech, Inc.: *See*—
Recchuite, Alexander D., 4,321,153, Cl. 252-48.600.

Suntex Products, Inc.: *See*—
Sun, Evelyn L.; and Sun, Robert J., 4,320,760, Cl. 128-303.00R.

Surface Technology, Inc.: *See*—
Feldstein, Nathan, 4,321,285, Cl. 427-97.000.

Sutter, Franz, to Institut Straumann AG. Burner nozzle. 4,320,875, Cl. 239-462.000.

Suzuki, Yukio; Hirano, Masachika; and Aketa, Koichi, to Sumitomo Chemical Company Limited. Method for preparing an optically active α-cyano-3-phenoxybenzyl 2-(4-substituted-phenyl)isovalerate. 4,321,212, Cl. 260-465.00D.

Svensson, Hans T., heir: *See*—
Svensson, Karl-Erik, deceased; Svensson, Henny A. V., heiress; Svensson, Karl J., heir; and Svensson, Hans T., heir, 4,320,877, Cl. 242-81.000.

Svensson, Henny A. V., heiress: *See*—
Svensson, Karl-Erik, deceased; Svensson, Henny A. V., heiress; Svensson, Karl J., heir; and Svensson, Hans T., heir, 4,320,877, Cl. 242-81.000.

Svensson, Karl-Erik, deceased; by Svensson, Henny A. V., heiress; by Svensson, Karl J., heir; and Svensson, Hans T., heir, to Telefonaktiebolaget L M Ericsson. Coil tying machine. 4,320,877, Cl. 242-81.000.

Svensson, Karl J., heir: *See*—
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Swiatosz, Edmund: *See*—
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Swiss Aluminium Ltd.: *See*—
Rebmann, Hans J.; and Mueller, Theo, 4,321,115, Cl. 204-67.000.

Sykes, Richard B.; and Parker, William L., to E. R. Squibb & Sons, Inc. Process for preparing antibiotics. 4,321,326, Cl. 435-121.000.

Syntex (U.S.A.) Inc.: *See*—
Walker, Keith A. M., 4,321,272, Cl. 424-273.00R.

Szabo, Bela G.; and Hirschfield, Dean J. Plastic containers for small valuable articles. 4,320,831, Cl. 206-45.340.

Taccone, Charles C., to Clearfield Machine Company. Coal burners, rotary furnaces incorporating the same and methods of operating. 4,321,034, Cl. 432-105.000.

Tachibana, Masami: *See*—
Sato, Akihiro; Tachibana, Masami; and Kikuta, Kazutsune, 4,321,345, Cl. 526-115.000.

Tada, Hiroshi; Abe, Wataru; Nozu, Toshiro; and Ishikawa, Keizo, to Oiles Co., Ltd. Method of erecting a bridge girder. 4,320,548, Cl. 14-1.000.

Taga, Genji: *See*—
Watanabe, Yoshiaki; Taga, Genji; and Teshima, Takanori, 4,321,161, Cl. 252-440.000.

Tahara, Yoshinori. Driving system. 4,320,677, Cl. 83-508.200.

Tai, Masaru: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,321,265, Cl. 424-246.000.

Takada, Juichiro. Vehicle occupant restraint belt retractor. 4,320,878, Cl. 242-107.600.

Takada, Kazuo: *See*—
Umeki, Shinji; Hamabata, Toshihiro; Onuki, Kazuaki; and Takada, Kazuo, 4,321,302, Cl. 428-404.000.

Takada, Shigetaka; and Watanabe, Yukihiro, to Aisan Industry Co., Ltd. Air-fuel mixture ratio control device. 4,320,730, Cl. 123-440.000.

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Toyama, Nobuo; and Takahashi, Shigekazu, 4,321,699, Cl. 368-255.000.

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Takahashi, Yoshihiro: *See*—
Nakajo, Toshihiko; Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,321,654, Cl. 361-396.000.

Takakura, Isamu: *See*—
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Takami, Katsumi: *See*—
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Takano, Shuntaro: *See*—
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Degawa, Takashi; Suginuma, Atsushi; Usui, Hideo; Kawashima, Kenichi; Kan, Tsuneo; and Takao, Kunihiko, 4,321,019, Cl. 417-269.000.

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Arimoto, Shunji; Shoji, Akio; Takezawa, Shoichiro; Ishikawa, Noboru; and Takeda, Hirofumi, 4,321,335, Cl. 525-116.000.

Takeda, Masaaki: *See*—
Yokokawa, Hiroshi; Hattori, Chutetsu; and Takeda, Masaaki, 4,321,537, Cl. 324-312.000.

Takeda, Osamu: *See*—
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Takeda, Yoshinobu; Kuroishi, Nobuhito; and Noji, Susumu, to Sumitomo Electric Industries, Ltd. Method for producing hot forged material from powder. 4,321,091, Cl. 75-213.000.

Takeda, Yuji: *See*—
Sawada, Daisaku; Shigematsu, Takashi; and Takeda, Yuji, 4,320,729, Cl. 123-425.000.

Takemoto, Issei: *See*—
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Ikeda, Hiroshi; and Takeuchi, Koji, 4,320,954, Cl. 355-3.00R.

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Takita, Hiroyuki: *See*—
Honda, Akira; Kumagai, Shinobu; and Takita, Hiroyuki, 4,320,668, Cl. 73-863.110.

Tamaki, Tohru, to Minnesota Mining and Manufacturing Company. Reel container. 4,320,834, Cl. 206-404.000.

Tamba, Shinichi: *See*—
Takada, Toshiyuki; Tamba, Shinichi; and Yamamoto, Hitoshi, 4,320,724, Cl. 123-73.0AD.

Tamura, Kikuo: *See*—
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,320,971, Cl. 356-328.000.

Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,321,560, Cl. 331-99.000.

Tamura, Takeo; and Nakamura, Tatuo, to Nissan Motor Co., Ltd.; and Ichiko Industries Limited. Outside mirror with wiper. 4,320,554, Cl. 15-250.00B.

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Tan, Toshimi; and Hisano, Katsukuni, to Hitachi, Ltd. Turbine blade fastening construction. 4,321,012, Cl. 416-217.000.

Tanabe, Kenziro: *See*—
Kimura, Yoshikazu; Tanabe, Kenziro; and Yonehara, Hiroyuki, 4,320,965, Cl. 355-74.000.

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Tanaka, Toshiaki: *See*—
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Tanaka, Yukihisa; and Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Small-sized switch with indicator. 4,321,442, Cl. 200-308.000.

Tancrell, Roger H., to Raytheon Company. Fresnel focussed imaging system. 4,320,660, Cl. 73-626.000.

Tangorra, Giorgio; and Cappa, Giulio, to Industrie Pirelli S.p.A. Power transmission belt. 4,321,049, Cl. 474-242.000.

Tappan Company, The: *See*—
Lamb, John T., 4,321,447, Cl. 219-10.55B.

Tappeiner, Hermann; Paessler, Ernst-Robert; Smutny, Kurt; and Krugel, Karl-Heinz, to Siemens Aktiengesellschaft. Powerline carrier control system. 4,321,581, Cl. 340-310.00R.

Tarasen, William L.: *See*—
Shaffer, Robert C.; and Tarasen, William L., 4,321,298, Cl. 428-242.000.

Tarpley, R. Wayne: *See*—
Rehn, Larry A.; and Tarpley, R. Wayne, 4,320,664, Cl. 73-708.000.

Tasar, Omur; Whiteside, Arliss E.; and Freedman, Morris D., to Bendix Corporation, The. Fault handler for a multiple computer system. 4,321,666, Cl. 364-200.000.

TDK Electronics Co., Ltd.: *See*—
Morita, Haruyuki; Kubota, Yuichi; and Imaoka, Yasuo, 4,321,303, Cl. 428-404.000.
Umeki, Shinji; Hamabata, Toshihiro; Onuki, Kazuaki; and Takada, Kazuo, 4,321,302, Cl. 428-404.000.

Teac Corporation: *See*—
Tsuyuguchi, Hiroshi, 4,321,635, Cl. 360-72.200.

Teepak, Inc.: *See*—
Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., 4,320,558, Cl. 17-42.000.

Tegal Corporation: *See*—
Bithell, Roger M., 4,321,232, Cl. 422-23.000.

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Ferrieu, Gilbert M. M., 4,321,430, Cl. 179-18.0FA.

Telectronics Pty. Limited: *See*—
Money, David, 4,320,763, Cl. 128-419.0PG.

Telediffusion de France: *See*—
Hernandez, Charles; and Marquet, Jean-Francois, 4,321,596, Cl. 340-724.000.

Telefonaktiebolaget L M Ericsson: *See*—
Svensson, Karl-Erik, deceased; Svensson, Henny A. V., heiress; Svensson, Karl J., heir; and Svensson, Hans T., heir, 4,320,877, Cl. 242-81.000.

Tengler, John N.: *See*—
Gabor, Robert J.; Tengler, John N.; and Braund, Kenneth W., 4,321,588, Cl. 340-381.000.

Tennant Company: *See*—
Kimzey, Paul W.; and Hanna, John L., 4,320,556, Cl. 15-347.000.

Tennant, Robert J., to AMP Incorporated. Photovoltaic power generation. 4,321,416, Cl. 136-244.000.

Tennes, Bernard R.; Wolthuis, Richard J.; and Burton, Clyde L., to United States of America, Agriculture. Vacuum-operated produce handling systems. 4,320,995, Cl. 406-39.000.

Terai, Kiyohide; and Mackertich, George, to International Vacuum, Inc. Electron-beam welding. 4,321,453, Cl. 219-121.0ED.

Terraillon, Paul. Formwork apparatus for casting directly on the ground accurate concrete slabs. 4,321,024, Cl. 425-111.000.

Teshima, Takanori: *See*—
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Teske, Lothar. Arm-type feeder wheel for unloading solids from a bin. 4,320,828, Cl. 198-803.000.

Tessarolo, Francesco: *See*—
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Texaco Canada, Inc.: *See*—
McCoy, David R.; Gipson, Robert M.; and Young, Kitchener B., 4,321,146, Cl. 210-708.000.
McCoy, David R.; and LaBerge, Colin L., 4,321,147, Cl. 210-708.000.
McCoy, David R.; Gipson, Robert M.; Young, Kitchener B.; and LaBerge, Colin L., 4,321,148, Cl. 210-708.000.

Texaco Development Corporation: *See*—
Cavitt, Stanley B., 4,321,206, Cl. 260-348.340.

Texaco, Inc.: *See*—
Canup, Robert E., 4,320,735, Cl. 123-606.000.
Herbstman, Sheldon; and Dorn, Peter, 4,321,062, Cl. 44-71.000.
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Sung, Rodney L.; and Sidote, George J., 4,321,060, Cl. 44-53.000.
Vanderpool, Steven H., 4,321,413, Cl. 568-672.000.

Texas Instruments Incorporated: *See*—
Harris, Ralph A.; and Carroll, Paul E., 4,321,675, Cl. 364-421.000.
Naden, Rex A., 4,321,693, Cl. 365-15.000.
Redwine, Donald J.; and White, Lionel S., Jr., 4,321,695, Cl. 365-174.000.
Rehn, Larry A.; and Tarpley, R. Wayne, 4,320,664, Cl. 73-708.000.

Thain, Eberhard M.: *See*—
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Thams, Johan-Petter B. Process for coating a metal article on and at an edge. 4,321,290, Cl. 427-289.000.

Theeuwes, Felix, to Alza Corporation. Dispenser with diffuser. 4,320,759, Cl. 128-260.000.

Theleme Corporation: *See*—
Sommeria, Marcel R., 4,321,684, Cl. 364-602.000.

Thibodeau, Leslie N.; Luz, David W.; and Hicks, James E., to RCA Corporation. Commutated SCR regulator for a horizontal deflection circuit. 4,321,514, Cl. 315-411.000.

Thom, James B.; and Ejzak, Richard P., to Sundstrand Corporation. Differential fault current protection of a multiprocessor controlled electric power generating system. 4,321,645, Cl. 361-63.000.
Thomas, Arthur L.: *See—*
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Thomas, Francis E.: *See—*
Brunst, George E.; Thomas, Francis E.; and Wanner, Walter W., 4,320,898, Cl. 273-51.000.
Thomas, Victor M.; and Mahoney, Martin D., to Stauffer Chemical Company. Certain halogenated phenols as antidotes for thiocarbamate herbicides. 4,321,084, Cl. 71-100.000.
Thompson, Francis T.: *See—*
Sackin, Milton; Edison, David M.; and Thompson, Francis T., 4,321,681, Cl. 364-492.000.
Thompson, Robert B.: *See—*
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Thompson, Thomas K.: *See—*
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Thomson-CSF: *See—*
Antoniotti, Pierre; Matge, Alain; and Guillon, Philippe, 4,320,833, Cl. 206-309.000.
Arquie, Louis; and Bricot, Claude, 4,321,701, Cl. 369-45.000.
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Boulanger, Philippe; Kaplan, Daniel; and Mourier, Georges, 4,320,716, Cl. 118-723.000.
Duda, Eugene; Maumy, Alain; and Tondu, Claude, 4,321,617, Cl. 357-71.000.
Kaplan, Daniel; Sol, Nicole; and Landouar, Pierre, 4,321,420, Cl. 136-255.000.
Lehureau, Jean-Claude, 4,321,634, Cl. 360-70.000.
Thomson, Eric A.: *See—*
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Thornburg, David D., to Xerox Corporation. Keyswitch arrangement. 4,321,441, Cl. 200-159.00A.
Tichelaar, Gerrit W.: *See—*
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Ticker, Arthur: *See—*
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Tiemann, Jerome J., to General Electric Company. Recursive charge transfer filter with a transmission zero at zero frequency. 4,321,481, Cl. 307-221.00D.
Timmons, John P., to Schlumberger Technology Corporation. Method of merging information on storage media. 4,321,670, Cl. 364-300.000.
Tiskus, John R., to United States Steel Corporation. Thermocouple apparatus for indicating liquid level in a container. 4,320,656, Cl. 73-295.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,321,346, Cl. 526-142.000.
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Todd, Lowell H., Sr. Method of fabricating a sheath for a knife. 4,320,569, Cl. 29-469.500.
Toho Beslon Co., Ltd.: *See—*
Ogawa, Hiroyasu; Nonaka, Kazuo; and Noda, Hiroto, 4,321,446, Cl. 219-10.49R.
Tokiwa, Hideharu: *See—*
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Tokuyama Soda Kabushiki Kaisha: *See—*
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Tomiyama, Tetsuo; and Ogura, Takashi, to Seikagaku Kogyoco Ltd. Latex composition and method for determining erythropoietin. 4,321,058, Cl. 23-230.00B.
Tomlin, Jerry B.; and Strickland, James N., to Daniel Industries, Inc. Actuator mechanism for lift-turn valves. 4,320,777, Cl. 137-315.000.
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Toy, Madeline S.; and Stringham, Roger S., to United States of America, Air Force. Perfluorocompounds. 4,321,359, Cl. 528-397.000.
Toyama Chemical Co., Ltd.: *See—*
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Toyama, Nobuo; and Takahashi, Shigekazu, to Ricoh Watch Company, Limited. Wrist watch with alarm. 4,321,699, Cl. 368-255.000.
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Tresch, Erwin, to Cerberus AG. Smoke detector. 4,321,595, Cl. 340-630.000.
Troxel, William R. W.: *See—*
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Trudeau, Roger. Chain saw support. 4,320,679, Cl. 83-574.000.
Trump, Bruce C., to Zenith Radio Corporation. Digital BFO metal detecting device with improved sensitivity at near-zero beat frequencies. 4,321,539, Cl. 324-328.000.
Trutzschler GmbH & Co. KG: *See—*
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Tsao, George T.: *See—*
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Tsuchihashi, Michihiro; Itatani, Ryohei; Ryohko, Masatoshi; and Murai, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Discharge lamp and lighting equipment. 4,321,506, Cl. 315-35.000.
Tsuda, Masabumi: *See*—
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,321,224, Cl. 264-115.000.
Tsuji, Shoichi; Aoki, Kiyoshi; and Asai, Minoru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Combustion furnace or reactor with multi-stage fluidized bed system. 4,321,233, Cl. 422-142.000.
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Westgate, Peter S.: *See—*
Hoy, Leslie R. J.; and Westgate, Peter S., 4,321,174, Cl. 523-101.000.

Westinghouse Electric Corp.: *See—*
Allen, Jerry W., 4,321,535, Cl. 324-209.000.
Bhalla, Ranbir S., 4,321,503, Cl. 313-211.000.
Bluzer, Nathan; Lampe, Donald R.; and Kub, Francis J., 4,321,614, Cl. 357-30.000.
Long, Lawrence J., 4,321,497, Cl. 310-198.000.
Miller, Robert C., 4,321,464, Cl. 250-231.00R.
Morozowich, Merle; and Bonkowski, Richard L., 4,321,485, Cl. 307-300.000.
Sackin, Milton; Edison, David M.; and Thompson, Francis T., 4,321,681, Cl. 364-492.000.

Westland Aircraft Limited: *See—*
Humphrey, Geoffrey J., 4,320,633, Cl. 64-25.000.

Westphal, Bernd A. K.; Moore, James H., Jr.; and Livingston, Richard G., to General Electric Company. Method and apparatus for thermal stress controlled loading of steam turbines. 4,320,625, Cl. 60-646.000.

Whaley, Howard A.; and Coats, John H., to Upjohn Company, The. Saccharopolyspora culture. 4,321,329, Cl. 435-253.000.

Wheeler, Ernest E. Narrow-band, air-cooled light fixture. 4,321,659, Cl. 362-293.000.

Whirlpool Corporation: *See—*
Kristof, Mark J.; and Schwaderer, John R., 4,321,445, Cl. 219-10.55C.

Whitbread, Raymond J.: *See—*
Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., 4,321,431, Cl. 179-18.0AH.

Whitcomb, Rodney J.; and Adamski, Henry S., to Eastman Kodak Company. Apparatus for forming electrical contact with an analysis slide. 4,321,122, Cl. 204-195.00R.

White, James B.: *See—*
Mercer, Jeffrey L.; and White, James B., 4,320,858, Cl. 222-146.0HE.

White, James F.: *See—*
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White, Lionel S., Jr.: *See—*
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Whitefield, John T., to Allen Organ Company. Asynchronous interface for keying electronic musical instruments using multiplexed note selection. 4,320,683, Cl. 84-115.000.

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Whitney, Douglass G.; and Martin, John K., III. Self contained injection system. 4,320,757, Cl. 128-214.00F.

Widder, Rudi: *See—*
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Widerby, Lennart; and Eriksson, Birger, to AB Svenska Flaktfabriken. Air diffuser. 4,320,695, Cl. 98-40.00N.

Widiger, Alexander H., Jr.; Randall, Osro W., III; and Pulver, Steven M., to Dow Chemical Company, The. High density ion exchange resins from haloalkylated aromatic polymer. 4,321,331, Cl. 521-32.000.

Widmer & Ernst AG: *See—*
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Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,321,362, Cl. 536-17.00R.

Wilhoite, Murray O., to Martin Industries, Inc. Combustion type heater. 4,320,739, Cl. 126-110.00A.

Wilkinson, James H. Sprayable perfluoroalkoxy solutions. 4,321,177, Cl. 524-375.000.

Wilkinson, Wilfred H.; Pateman, Edwin; Gale, Anthony G.; and Slinger, John, to Rolls-Royce Limited. Aerofoil member for a gas turbine engine. 4,321,010, Cl. 416-92.000.

Willems, Gerardus A. M.; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and welding torch for arc welding. 4,321,454, Cl. 219-121.0PJ.

Williams, Brian H.; and Young, Chung-I, to Minnesota Mining and Manufacturing Company. Compositions for providing abherent coatings. 4,321,404, Cl. 560-115.000.

Williams, George: *See—*
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Williams, Joseph C.: *See—*
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Williams, Lonnie M., to Williams Panel Board Company. Apparatus for disassembling wooden pallets. 4,320,570, Cl. 29-564.300.

Williams Panel Board Company: *See*—
Williams, Lonnie M., 4,320,570, Cl. 29-564.300.

Williams, Richard R., to United States of America, Energy. Method and device for determining the position of a cutting tool relative to the rotational axis of a spindle-mounted workpiece. 4,320,580, Cl. 33-185.00R.

Willis, Donald H., to RCA Corporation. Linearity corrected deflection circuit. 4,321,511, Cl. 315-387.000.

Wilms, Klaus G.; and Waldmann, Helmut, to Bayer Aktiengesellschaft. Treating effluent with peroxide and iron. 4,321,143, Cl. 210-631.000.

Wilson, George P. Attachment for antennas to improve reception and transmission. 4,321,603, Cl. 343-750.000.

Wilwerding, Dennis J.: *See*—
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Winchell, David A.: *See*—
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Winkler & Dunnebier: *See*—
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Winter, David C., to Deere & Company. Wing fold implement and folding sequence control therefor. 4,320,805, Cl. 172-776.000.

Winter, Heinrich, to SKF Kugellagerfabriken GmbH. Axial roller bearing for rolling mills. 4,320,930, Cl. 308-234.000.

Wirtz, Hans, to Dyckerhoff & Widmann Aktiengesellschaft. Planter formed of concrete or a similar settable material. 4,320,596, Cl. 47-66.000.

Wisconsin Alumni Research Foundation: *See*—
Langer, Stanley H.; and Pate, Kevin T., 4,321,313, Cl. 429-13.000.
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Woditsch, Peter: *See*—
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Wolf, Mert L. Flue arrangement for stove and fireplace. 4,320,737, Cl. 126-58.000.

Wolthuis, Richard J.: *See*—
Tennes, Bernard R.; Wolthuis, Richard J.; and Burton, Clyde L., 4,320,995, Cl. 406-39.000.

Wood, Kenneth E., to United States of America, National Aeronautics and Space Administration. High temperature penetrator assembly with bayonet plug and ramp-activated lock. 4,320,911, Cl. 285-89.000.

Woodgate, Ralph W. Method and apparatus for condensation heating. 4,321,031, Cl. 432-11.000.

Wu, Ming Y., to Yu, Jim. Key removable cylinder assembly from locket. 4,320,637, Cl. 70-224.000.

Wu, Ray J.; Bahl, Chander P.; and Narang, Saran A., to Research Corporation. Oligonucleotides useful as adaptors in DNA cloning, adapted DNA molecules, and methods of preparing adaptors and adapted molecules. 4,321,365, Cl. 536-27.000.

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Kay, David B., 4,320,955, Cl. 355-3.00R.
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Yakushiji, Hisao, to Vlsi Technology Research Association. Manufacturing method for semiconductor device. 4,321,284, Cl. 427-89.000.

Yamamoto, Hiroshi: *See*—
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, 4,321,679, Cl. 364-474.000.

Yamamoto, Hitoshi: *See*—
Takada, Toshiyuki; Tamba, Shinichi; and Yamamoto, Hitoshi, 4,320,724, Cl. 123-73.0AD.

Yamamoto, Naoki: *See*—
Hasegawa, Norio; Yamamoto, Naoki; and Yanazawa, Hiroshi, 4,321,104, Cl. 156-643.000.

Yamamoto, Yosimi: *See*—
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Yamashita, Hiroshi; Izawa, Fumio; and Yanagida, Seiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Recording-reproduction apparatus for an endless tape. 4,321,637, Cl. 360-93.000.

Yamashita, Youhachi; Yokoyama, Katsunori; Ido, Tadashi; and Yoshida, Seiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Piezoelectric oxide material. 4,321,155, Cl. 252-62.900.

Yamazaki, Takeshi: *See*—
Shimooka, Riyo; Atoji, Hitomi; Yamazaki, Takeshi; and Kunisawa, Masuo, 4,321,620, Cl. 358-75.000.

Yanagida, Isao: *See*—
Fujii, Tsuyoshi; and Yanagida, Isao, 4,321,009, Cl. 415-172.00R.

Yanagida, Seiichi: *See*—
Yamashita, Hiroshi; Izawa, Fumio; and Yanagida, Seiichi, 4,321,637, Cl. 360-93.000.

Yanagisawa, Sinobu: *See*—
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Yang, Tai H.: *See*—
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Yankovsky, Nikolai K.: *See*—
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Yasuda, Ken-ichi; and Shida, Shigeru, to Hitachi, Ltd. Method and apparatus for correcting asymmetrical condition in rolling mill. 4,320,643, Cl. 72-8.000.

Yasuda, Takashi: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,321,265, Cl. 424-246.000.

Yeh, Yea-Chuan M.: *See*—
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Yokohama Rubber Co., Ltd., The: *See*—
Ueda, Akio; Akita, Shuichi; Hirakawa, Hiroshi; and Ahagon, Asahiro, 4,321,168, Cl. 524-526.000.

Yokokawa, Hiroshi; Hattori, Chutetsu; and Takeda, Masaaki, to Hitachi, Ltd. Fourier transform nuclear magnetic resonance spectrometer. 4,321,537, Cl. 324-312.000.

Yokono, Hitoshi: *See*—
Shoji, Fusaji; Takemoto, Issei; Yokono, Hitoshi; and Isogai, Tokio, 4,321,319, Cl. 430-270.000.

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Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Power supply circuit for electrical apparatus. 4,321,662, Cl. 363-86.000.

Yonehara, Hiroyuki: *See*—
Kimura, Yoshikazu; Tanabe, Kenziro; and Yonehara, Hiroyuki, 4,320,965, Cl. 355-74.000.

Yoo, Jin S., to Atlantic Richfield Company. Phosphorus passivation process. 4,321,128, Cl. 208-114.000.

Yoshiba, Yutaka, to Ricoh Company, Ltd. High legibility multi-character dot matrix display. 4,321,599, Cl. 340-804.000.

Yoshida, Masaru: *See*—
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Yoshida, Seiichi: *See*—
Yamashita, Youhachi; Yokoyama, Katsunori; Ido, Tadashi; and Yoshida, Seiichi, 4,321,155, Cl. 252-62.900.

Yoshida, Takao, to International Flavors & Fragrances Inc. Methyl substituted oxobicyclo-4,4,0-decane derivatives, process for preparing same and organoleptic uses thereof. 4,320,772, Cl. 131-276.000.

Yoshida, Takashi: *See*—
Fujie, Masakatsu; Sugiyama, Kengo; Yamamoto, Hiroshi; Yoshida, Takashi; and Endo, Yutaka, 4,321,679, Cl. 364-474.000.

Yoshida, Yoshinori; and Shinohara, Hironobu, to Japan Synthetic Rubber Co., Ltd. Process for producing conjugated diene monoesters. 4,321,409, Cl. 560-244.000.

Young, Chung-I: *See*—
Williams, Brian H.; and Young, Chung-I, 4,321,404, Cl. 560-115.000.

Young, Kitchener B.: *See*—
McCoy, David R.; Gipson, Robert M.; and Young, Kitchener B., 4,321,146, Cl. 210-708.000.
McCoy, David R.; Gipson, Robert M.; Young, Kitchener B.; and LaBerge, Colin L., 4,321,148, Cl. 210-708.000.

Young, Otto V.: *See*—
Kramer, Joseph O.; Young, Otto V.; Banner, Charles E.; and Schuster, John D., 4,320,826, Cl. 198-425.000.

Yu, Jim: *See*—
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Zabrocki, Karl; Dhein, Rolf; Weider, Franz; Hohne, Klaus; and Schorn, Kurt, to Bayer Aktiengesellschaft. Aqueous polyester dispersions. 4,321,170, Cl. 524-285.000.

Zambelli, Adolfo: *See*—
Beach, David L.; and Zambelli, Adolfo, 4,321,347, Cl. 526-151.000.

Zamma, Jun: *See*—
Ohsaki, Kozo; Zamma, Jun; Kobayasi, Yukihiro; and Watanabe, Hiroshi, 4,321,234, Cl. 422-200.000.

Zappa, Oswald L., to Avco Everett Research Laboratory, Inc. Recirculating gas laser. 4,321,558, Cl. 372-58.000.

Zelinski, Robert P., to Phillips Petroleum Company. Water termination of poly(arylene sulfide) curing. 4,321,358, Cl. 528-388.000.

Zenith Radio Corporation: *See*—
Alvord, Robert J.; Beaumont, Gregory J.; and Steinmetz, Richard J., 4,321,512, Cl. 315-411.000.
Srivastava, Gopal K., 4,321,488, Cl. 307-353.000.
Trump, Bruce C., 4,321,539, Cl. 324-328.000.

Zenker, Hartwig: *See*—
Rieger, Werner; Elsasser, Horst; Zenker, Hartwig; Bittlingmaier, Alfred; and Dalferth, Hans H., 4,320,620, Cl. 59-93.000.

Zhdanova, Nelli I.: *See*—
Debabov, Vladimir G.; Zhdanova, Nelli I.; Sokolov, Alexandr K.; Livshits, Vitaly A.; Kozlov, Jury I.; Khurges, Evgeny M.; Yankovsky, Nikolai K.; Gusyatiner, Mikhail M.; Sholin, Albert F.; Antipov, Viktor P.; and Pozdnyakova, Tamara M., 4,321,325, Cl. 435-115.000.

Ziebarth, Timothy D.: *See*—
Mueller, Gary E.; and Ziebarth, Timothy D., 4,320,940, Cl. 351-44.000.

Zimmern, Bernard, to Uniscrew Limited. Inter-engaging threaded rotor and pinion machine with multi-edged pinion tooth flanks. 4,321,022, Cl. 418-195.000.

Zmievskoi, Nikolai N.: *See*—
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; Zmievskoi, Nikolai N.; and Shaty, Pavel P., 4,321,125, Cl. 204-273.000.

Zuppinger, Paul; and Baumann, Dieter, to Ciba-Geigy Corporation. Process for the production of epoxy resin castings. 4,321,351, Cl. 528-91.000.

Zwiener, Rudolf, to Adolph Saurer Limited. Mechanism on shuttleless looms for the transfer of the end of the weft yarn. 4,320,785, Cl. 139-444.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cincinnati Milacron Inc.: *See—*
Rieder, Walter E., Re. 30,885, Cl. 252-34.000.

Enomoto, Hiroshi: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, Re. 30,886, Cl. 424-267.000.

Hach Chemical Company: *See—*
Stookey, Lawrence L., Re. 30,888, Cl. 544-182.000.

Kono, Tatsuhiko: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, Re. 30,886, Cl. 424-267.000.

Nippon Shinyaku Company Ltd.: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, Re. 30,886, Cl. 424-267.000.

Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, to Nippon Shinyaku Company Ltd. Method and composition for reducing blood glucose levels. Re. 30,886, Cl. 424-267.000.

Olin Corporation: *See—*
Turley, Richard J., Re. 30,887, Cl. 521-107.000.

Rieder, Walter E., to Cincinnati Milacron Inc. Novel diamide and lubricants containing same. Re. 30,885, Cl. 252-34.000.

Stookey, Lawrence L., to Hach Chemical Company. Ferroin reagent. Re. 30,888, Cl. 544-182.000.

Turley, Richard J., to Olin Corporation. Flame retardant polyurethane foam. Re. 30,887, Cl. 521-107.000.

Yagi, Masahiro: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, Re. 30,886, Cl. 424-267.000.

Yoshikuni, Yoshiaki: *See—*
Ohata, Katsuya; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, Re. 30,886, Cl. 424-267.000.

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Aburatani, Isao: *See—*
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Adamek, David J.: *See—*
Dutcher, Daniel P.; and Adamek, David J., 263,450, Cl. D9-430.000.

Ainslie, Diane B., to Eastman Kodak Company. Photographic camera or similar article. 263,477, 3-23-82, Cl. D16-6.000.

Allibert Exploitation Societe Anonyme: *See—*
Deconinck, Didier, 263,435, Cl. D6-70.000.

American Cyanamid Company: *See—*
Black, Seymour, 263,505, Cl. D24-99.000.

Amirault, Gerald A. Vision shield for a student typist or the like. 263,432, 3-23-82, Cl. D2-234.000.

Anderson, Karen L. Doll. 263,489, 3-23-82, Cl. D21-171.000.

Associated Mills, Inc.: *See—*
Grube, Clifford E., 263,439, Cl. D6-201.000.

Astra-Meditec AB: *See—*
Jarund, Harry S. V., 263,449, Cl. D9-415.000.

Atari, Inc.: *See—*
Nishi, Roy; and Farnell, Russ, 263,472, Cl. D14-109.000.

Bartscher, Franz, to Josef Schonlau Maschinenfabrik-und Eidengiesserei. Floor panel for a pig shed. 263,511, 3-23-82, Cl. D30-2.000.

BASF Aktiengesellschaft: *See—*
Lee, Geoffrey M., 263,469, Cl. D14-11.000.

Bausch & Lomb, Incorporated: *See—*
Van Exel, Gerrit A.; and Huckenbeck, Claus O., 263,479, Cl. D16-126.000.

Baxter Travenol Laboratories, Inc.: *See—*
Fowlee, Thomas A.; and Winchell, David A., 263,504, Cl. D24-99.000.

Bisbing, Robert H., to Southco, Inc. Hinge pin. 263,446, 3-23-82, Cl. D8-323.000.

Black, Seymour, to American Cyanamid Company. Dispenser for surgical sutures. 263,505, 3-23-82, Cl. D24-99.000.

Block, Thomas S., to McGraw-Edison Company. Scrubber. 263,475, 3-23-82, Cl. D32-16.000.

Borg-Warner Corporation: *See—*
Neff, Sterling R., 263,431, Cl. D2-233.000.

Brown, James E., to Bunn-O-Matic Corporation. Package of filters. 263,447, 3-23-82, Cl. D9-352.000.

Bunn-O-Matic Corporation: *See—*
Brown, James E., 263,447, Cl. D9-352.000.

Carre, Alain, to Waterman S.A. Pen. 263,482, 3-23-82, Cl. D19-51.000.

Carrier Corporation: *See—*
Hoyle, Walter W., 263,495, Cl. D23-141.000.

Cars & Concepts, Inc.: *See—*
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Chan, Ming K. Strobelight. 263,506, 3-23-82, Cl. D26-41.000.

Chen, Yi. Interlocking game piece. 263,483, 3-23-82, Cl. D21-51.000.

Chen, Yi. Card holder. 263,484, 3-23-82, Cl. D21-54.000.

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Cunha, Lawrence J. Key-mounted flashlight. 263,433, 3-23-82, Cl. D3-63.000.

Deconinck, Didier, to Allibert Exploitation Societe Anonyme. Folding chair. 263,435, 3-23-82, Cl. D6-70.000.

Dictaphone Corporation: *See—*
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Drost, Jim L.: *See—*
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Durben, Donald M. Stone guard for automobile fender. 263,463, 3-23-82, Cl. D12-190.000.

Dutcher, Daniel P.; and Adamek, David J., to Champion International Corporation. Combined carton and lid. 263,450, 3-23-82, Cl. D9-430.000.

Eastman Kodak Company: *See—*
Ainslie, Diane B., 263,477, Cl. D16-6.000.

Emerson Electric Co.: *See—*
Markum, Randall T.; and Patel, Yogesh P., 263,494, Cl. D23-127.000.

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Nishi, Roy; and Farnell, Russ, 263,472, Cl. D14-109.000.

Fathi, Saul S., to Franzus Company, Inc. Voltage converter or similar article. 263,465, 3-23-82, Cl. D13-4.000.

Feild, Henry A. Barbecue grill housing. 263,440, 3-23-82, Cl. D7-107.000.

Football League Limited, The: *See—*
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Grubbs, Edward D. C. Fingerprint medallion. 263,455, 3-23-82, Cl. D11-104.000.
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Hickman, Ronald P., to Tekron Licensing B.V. Exercise machine. 263,490, 3-23-82, Cl. D21-192.000.
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Johnson, Marshall B.; and Gott, Amos, to Wear-Ever Aluminum, Inc. Cooking utensil cover or the like. 263,441, 3-23-82, Cl. D7-131.000.
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Kearney, Ralph M., III, to Ralph Kearney & Son, Inc. Roof curb for supporting a ventilator. 263,497, 3-23-82, Cl. D23-163.000.
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Surridge, Stuart S., to Football League Limited, The. Soccer ball. 263,491, 3-23-82, Cl. D21-205.000.
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Teitelbaum, Menashe; and Kolman, Philip, to Varitech Security Systems, Inc. Signal receiver for monitoring an alarm system. 263,453, 3-23-82, Cl. D10-104.000.
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Turcotte, Guy, to Lavo Ltee/Ltd. Bottle. 263,448, 3-23-82, Cl. D9-376.000.
Van Exel, Gerrit A.; and Huckenbeck, Claus O., to Bausch & Lomb, Incorporated. Resilient clip for retaining removable lenses in an eyeglass frame. 263,479, 3-23-82, Cl. D16-126.000.
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Wada, Masao, to Casio Computer Co., Ltd. Wrist watch. 263,452, 3-23-82, Cl. D10-38.000.
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LIST OF PLANT PATENTEES

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CLASSIFICATION OF PATENTS

ISSUED MARCH 23, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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636 4,320,842

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631 4,321,143
661 4,321,144
678 4,321,145
708 4,321,146
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720 4,321,149
769 4,321,150
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4,321,321
04 : 4,320,649
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